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A SUMMARY OF SOURCE DATA IN MILITARY PSYCHIATRIC
EPIDEMIOLOGY

William E. Datei

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A SUMMARY OF SOURCE DATA IN MILITARY PSYCHIATRIC EPIDEMIOLOGY

WILLIAM E. DATEL, Ph.D.

Department of Military Psychiatry

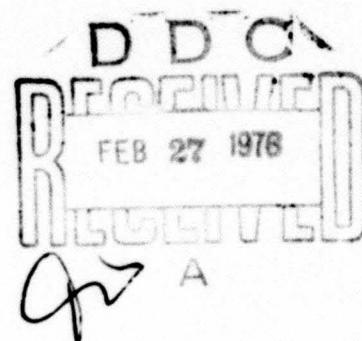
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Air Force

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

See attached manuscript

A SUMMARY OF SOURCE DATA IN MILITARY PSYCHIATRIC EPIDEMIOLOGY

William E. Datel, Ph.D.

Epidemiology is the study of the distribution of disease in time and space. Since disease cannot be observed directly (it must always be inferred from observables), epidemiology becomes the study of the distribution of indicators of disease.

The purpose of this paper is to present information on several indicators of psychiatric disease over a period of several decades in United States military populations and to comment upon the meaning and implications of the information presented. Particular attention is paid to the period from 1942 through the first six months of 1973. The United States Army active duty population receives the greatest emphasis in the material presented.

METHOD

Three disease indicators are studied: (1) the rate of disease diagnoses resulting from hospitalizations, (2) the rate of visits to out-patient facilities, and (3) the number and proportion of beds occupied in hospitals.

The rate of hospitalization diagnoses is expressed in terms of the number of hospitalization diagnoses recorded per 1000 persons-at-risk per one year's time. The rate of out-patient visits is expressed in terms of the number of out-patient facility visits per 1000 persons-at-risk per one day's time. Persons-at-risk refers to the total number

of persons eligible for care; this number is represented by the average strength figure for the year in question for the population in the geographic area studied.

The data sources for the material presented are (1) Health of the Army, (2) Volumes I and II of Neuropsychiatry in World War II, Medical Department, United States Army, and (3) annual reports of the Surgeon Generals of the United States Navy and the United States Air Force.¹

The time-periods selected for study were determined in part by the availability of data. For example, Health of the Army suspended publication with its June 1973 issue. The annual reports of the Surgeon Generals of the Navy and the Air Force suspended publication with the 1969 and 1971 volumes, respectively.²

Gaps occur within some of the trend lines presented. This is because source data were missing or were simply not collected for the period in question. The recurring interruption in the trend line from 1946 through 1950 for particular neuropsychiatric diseases in the Army population results from the fact that the United States Army Surgeon General did not break out neuropsychiatric disease categories during this period.

¹Footnotes are numerically keyed and appear on pages 17-18 of the paper.

It was necessary to derive all neuropsychiatric sub-classification rates for the Army for the year 1951 by averaging rates for June through December, since the neuropsychiatric disease categories were not broken out for the first five months of 1951. For the sake of consistency the overall neuropsychiatric rate for the Army for 1951 is based on the same seven-month period. To obtain Army rates for mid-1973, the monthly rates for the first six months were averaged.

In the mid-1960's the United States Navy Surgeon General reported incidence on a fiscal year basis; this can be observed by noting mid-year placement on the X-axis for these data.³

In the sources' calculations of rates there apparently was not always precise geographic and population correspondence between the numerator, i.e., number of diagnoses, and the denominator, i.e., average strength. There appears to have been some shift over time in the criteria for cases included and in the boundaries for strength counted. (See, for example, Health of the Army, May 1973, p. 12). It is assumed that any error so introduced is no greater than the unknown error attributable to diagnostic unreliability and to that usually associated with information generated from multiple sources. In spite of these problems it is believed that the data presented are worthy of inspection and post hoc interpretation.

FINDINGS I: INCIDENCE OF HOSPITALIZATION DIAGNOSES

Neuropsychiatric Disorder in the Army: 1915 through mid-1973

Figure 1 is a posting of the incidence of neuropsychiatric disorder in United States Army active duty personnel on a worldwide basis as measured by the number of neuropsychiatric hospitalization diagnoses made per 1000 persons in the Army's annual strength per year. Thus, the rate represents episodes of hospitalized neuropsychiatric illness, not persons hospitalized with neuropsychiatric illness. There is no way of ascertaining how many separate individuals account for the resultant rate.

Insert Fig. 1 about here.

Three, perhaps four, peaks are evident on the neuropsychiatric disorder trend line: 1918 (rate of 27.59), 1943 (49.60), 1951 (25.70),⁴ and, apparently, mid-1973 (20.90). The first three peaks are contiguous with war-time; the latest elevation shows a slight lag time from the time of highest intensity (1968-1969) of the Vietnam conflict. The curve is further characterized by two decades of low neuropsychiatric incidence: the 1930's (average rate of 13.39) and the 1960's (average rate of 12.15).

The worldwide neuropsychiatric incidence in the active duty Army is broken out in terms of psychiatric disorder and neurological disorder in Figure 2. The relatively high incidence of neurological disease from 1915 through 1927 must

be interpreted in light of the fact that many diseases since labeled psychiatric were once called neurological (for example, hysteria, neurasthenia, and neurocirculatory asthenia). From World War II on, neurological incidence shows a steady decline, almost to asymptote. The last three neurological data points are projections, since Health of the Army did not tabulate neurological disorder in 1971, 1972, or 1973. The rate for psychiatric disorder at the last observation point (mid-1973), 19.90, approaches the 1951 elevation of 21.94.

Insert Fig. 2 about here.

Neuropsychiatric Disorder in the Three Armed Forces: 1942 through the early 1970's

Figure 3 enables comparison among the three armed services on the incidence of neuropsychiatric disorder from World War II to the time of latest data availability. The greatest inter-service discrepancy in neuropsychiatric rates occurred between the Army and the Navy in World War II: rates in the Army were more than twice that of rates in the Navy during this period; further, while the Army neuropsychiatric rates have never again approximated World War II levels, rates for the Navy are higher in the late 1960's than they were during World War II. The drop in incidence for the Navy from 1969 to 1970 is curious, since rates in the other two services have continued to climb since 1969.

Insert Fig. 3 about here.

Figures 4 and 5 break out the data from Figure 3 into psychiatric and neurological disorder. Psychiatric disorder rates for the Navy and the Air Force are amazingly similar from 1951 through 1964 after which the Navy departs on an upward trend, followed later conjointly by the Army and the Air Force. In terms of neurological disease, the trends for the three services are quite dissimilar. In the Army neurological disease incidence has shown a steady decline from World War II onward; the Air Force curve suggests rather a plateau throughout the years; and the Navy reported an upsurge in neurological disorders accompanying its rise in psychiatric rates in the late 1960's.

Insert Fig. 4 & 5 about here.

Turning to specific kinds of psychiatric disorder, we can observe the incidence of psychosis for all three services over the noted time period in Figure 6. The most striking observation of these data is a complementary tri-fold one: the psychosis rate for the Army has never been higher than the last observation point (mid-1973); it has never been higher for the Air Force than the last observation point (1971); and it was never higher in the Navy than it was at its last published annual medical report (1969).

Insert fig. 6 about here.

The same tri-fold assertion holds for character and behavior disorder when it is treated as a single entity (Figure 7)⁵ or when it is pooled with mental disorders

relegated to "other" (Figure 9 -- which excludes psychosis and psychoneurosis but includes character and behavior disorder and "other"). However, when psychoneurosis is studied separately (Figure 7), we notice neither a late upward climb nor a maximum incidence rate for the last periods of observation. Psychoneurosis, at least in the Army, has waned considerably in fashion as a diagnostic descriptor since the days of World War II.

Insert Fig. 7, 8, 8a, & 9 about here.

For the Army, then, excepting neurological disorders and psychoneurotic disorders, the incidence of neuropsychiatric disease has never been higher (including World War II) than it was observed to have been in mid-1973. Likewise for the Air Force with respect to its last available data point. We have already noted that for the Navy overall neuropsychiatric rates in the late 1960's were higher than they had ever been (World War II included).

To try to account partially for this rather alarming recent rise in psychiatric disorder in all three services, and implicitly suspecting illicit drug use as a factor, the hepatitis rates for all three services were explored. They are plotted in Figure 10. Only with respect to the Army does there seem to be a parallel rise in hepatitis and psychiatric disorder. The argument for drug-induced psychiatric illness across all three services is therefore attenuated.

Insert Fig. 10 about here.

Psychiatric Disorder Over Time by Geographic Areas: Active Duty Army

One can raise the question as to whether there is characteristically a differential disease rate for overseas troops versus troops serving within the confines of continental United States. Figure 11 records the year-by-year rates for all diseases combined for the United States Army active duty worldwide population and for CONUS troops and overseas troops separately. From 1943 to 1957 disease incidence ran somewhat higher overseas than in CONUS. After 1957, this trend began to reverse itself so that by mid-1973 the edge is noticeably in favor of higher disease incidence in CONUS than overseas.

Insert fig. 11 about here.

Psychiatric disease (Figure 12) does not follow the same geographic comparison pattern as the one observed for all diseases. There are more reversals and less consistency in the comparative trend lines for overseas vis-a-vis CONUS. For psychosis (Figure 13), however, the consistently lower incidence for overseas troops from 1951 on reverses itself in the late 1960's until in mid-1973 when the overseas psychosis rate is almost twice that of the CONUS rate. This latter finding may tend to implicate drug usage as an associative factor in the Army's increased psychosis incidence since there apparently was a drug epidemic in at least one overseas area in the late 1960's and early 1970's (Holloway, 1974).

Insert fig. 12 and 13 about here.

There are limitations in the extent to which one can study geographic-specific incidence data from the information presented in Health of the Army. Note Figure 14, which suggests that the Military District of Washington has been a hotbed for psychosis ever since 1952. This distortion in psychosis rate for MDW is obviously a result of utilizing a denominator value of insufficient magnitude to reflect Walter Reed General Hospital's catchment area. Similar misrepresentation in the psychotic rate for the Sixth United States Army area seems to occur during the period of the Vietnam conflict (see Figure 15). Perhaps this is due to counting psychotic evacuees twice.

Insert fig. 14 & 15 about here.

However, in inspecting data on motor vehicle casualty incidence, trends were observed in two areas which appear to be genuinely geographic-specific. Figure 16 indicates that the Fifth United States Army area has for many years been at high-risk for hospitalizations resulting from motor vehicle accidents. Europe likewise (see Figure 17).

Insert fig. 16 & 17 about here.

A matter long debated is whether combat itself embodies increased risk of psychiatric casualties. From the overseas versus COMUS psychiatric incidence curve (Figure 12), the findings are ambiguous and inconclusive. In World War II, psychiatric rates were higher in COMUS than they were overseas.

During the Korean and Vietnam conflicts, the incidence of psychiatric disorder is slightly higher overseas than in CONUS but the overseas rates for these periods included many non-combat troops (i.e., soldiers stationed in Europe and elsewhere).

This question is put to a somewhat more stringent test in Figures 18 and 19. Figure 18 shows that the incidence of psychiatric disorder was greater in combat areas than it was worldwide for Asian theatres but less great, if indeed at all greater, for European theatres. As for psychosis (Figure 19), the data show that incidence for combatants was greater in the southwest Pacific in World War II and in Vietnam than it was worldwide but not as great for combatants in Europe in World War II or in Korea during the Korean conflict as it was worldwide. That periods of war bring increased incidence of psychiatric disorder for the total Army (see Figure 2) seems fairly well established; that soldiers in combat zones incur psychiatric disorder at a higher rate than soldiers serving in other than a combat zone during the same war-time period has not always been the case.

Insert fig. 18 & 19 about here.

Proportion of Neuropsychiatric Disease to All Disease and Non-battle Injuries: Active Duty Army

It is of interest to ascertain the proportion of all disease and non-battle injury diagnoses to that which was solely neuropsychiatric. Figure 20 is a plot of the incidence

of diagnosis for all causes from 1942 through mid-1973 for worldwide, CONUS, and overseas active duty Army personnel. When the worldwide neuropsychiatric rates from Figure 1 are used as a numerator for the worldwide rates in Figure 20, the percentages plotted in Figure 21 result. It can be observed that for the years 1943, 1944, and 1945, neuropsychiatric diagnoses constituted between 6.3 to 7.6 percent of the total. At the time of the last observation, the proportion of neuropsychiatric disease was continuing to rise beyond a low point in 1968, reaching a percentage of 5.5 in mid-1973.

Insert Fig. 20 & 21 about here.

FINDINGS II: INCIDENCE OF OUT-PATIENT VISITS

Out-patient visits may also be studied as an indicator of disease occurrence. Figure 22 is a posting of the incidence of out-patient visits for all causes in United States Army active duty personnel on a worldwide basis as measured by the number of out-patient visits per day made per 1000 persons in the Army's annual strength. Rates cover the period from 1957 through 1972. The trend is upward, especially since 1966.

Insert Fig. 22 about here.

Equivalent data for neuropsychiatric out-patient visits only are presented in Figure 23. Again, the trend is upward over time, even more sharply so. At the last observation

point, 1972, there were 1.6 out-patient Army active duty neuropsychiatric visits per 1000 strength per day.

Insert Fig. 23 about here.

The proportion (i.e., percentage) of neuropsychiatric out-patient visits per out-patient visits for all causes is shown in Figure 24. The proportion of neuropsychiatric visits to total visits has almost doubled in the 1962-1972 decade. The last observation point is 7.1%, a proportion slightly greater in size to the 5.5% neuropsychiatric hospitalization diagnoses observed in Figure 21 for mid-1973.

Insert Fig. 24 about here.

The out-patient data indicate that neuropsychiatric disease is steadily increasing with respect to number of persons-at-risk and with respect to the fraction of total out-patient visits for all causes.

FINDINGS III: HOSPITAL BEDS OCCUPIED

The number of patients occupying hospital beds is another indicator of disease occurrence. This section presents information on the distribution across time of hospital bed occupancy for all personnel utilizing Army hospitals in continental United States. Twelve month-end bed occupancy figures were averaged for each year's period, resulting in a crude estimate of average daily bed occupancy for each year plotted.

Figure 25 is a plot of the average number of CONUS Army hospital beds occupied (per day) from 1943 through mid-1973 for all causes. When these absolute frequency counts are translated into Army strength percentages, Figure 26 is the result.⁶ Since 1954 the absolute number of beds occupied and the per cent beds occupied of Army strength have both remained fairly constant.

Insert Fig. 25 & 26 about here.

Figures 27 and 28 are the same data as those in Figures 25 and 26 except neuropsychiatric beds only are considered. Note in this instance (Figure 26) the incipient rise of late in the neuropsychiatric bed percentage of Army strength.

Insert Fig. 27 & 28 about here.

When the per cent neuropsychiatric beds of total beds are studied, Figure 29 is generated. Note that by this indicator, i.e., proportion of neuropsychiatric beds occupied per total beds occupied, the data line reaches steeply upward beginning in 1968. In mid-1973 the neuropsychiatric bed percentage is 12.5%, greater than it has ever been (including the so-called psychiatric disaster period of World War II).

Since bed occupancy is dependent upon two things, (1) number of admissions and (2) length of stay, and since neuropsychiatric incidence rates in the early 1970's do not reach World War II levels, obviously neuropsychiatric patients in the early 1970's were characterized by longer

hospital stays -- despite at least a two-decade resurgence led by Colonel A. J. Glass of the long-held tradition in military psychiatric doctrine of rapid disposition of cases (Hausman and Rioch, 1967). It is interesting, however, and perhaps complementary to the observed lengthening of hospital stays suggested by the bed occupancy data reviewed here, that two Navy epidemiology studies (Gunderson, 1971, p. 200) have suggested that the optimal length of hospitalization for military psychiatric patients may be considerably longer than we have believed.

Insert Fig. 29 about here.

SUMMARY AND CONCLUSIONS

In study of historical military epidemiological data three indicators of disease were presented and observed. These were (1) the rate of disease diagnoses stemming from hospitalizations, (2) the rate of visits made to out-patient facilities, and (3) the number and proportion of hospital beds occupied. The occurrence of neuropsychiatric disease in active duty Army personnel over time and within geographic boundary was the primary focus of the review. To assist in making comparisons and interpretations, data from other military populations and on other diseases were also presented. Some of the problems associated with interpretation of the data were mentioned; others were illustrated.

Observations made on all three indicators point toward a disturbing rise in the incidence of neuropsychiatric

disease in Army personnel beginning in the late 1960's and arising out of at least a decade of relative psychiatric quiescence.

The worldwide psychiatric incidence rate for active duty Army at the last observation point (mid-1973) approaches what it was during the height of the Korean conflict (19.90 hospitalized episodes per 1000 persons per year versus 21.94 hospitalized episodes per 1000 persons per year). The psychosis rate for worldwide active duty Army has never been higher than it was at the time of the last observation point, mid-1973. The same assertion can be made with respect to character and behavior disorder and with respect to character and behavior disorder combined with mental illness diagnoses relegated to "other." Similar incidence trends are apparent in the Navy and Air Force as well.

Active duty Army neuropsychiatric outpatient visits consumed almost twice the proportion of active duty Army out-patient visits for all causes in 1972 that they did in 1962. The proportion of Army hospital beds in continental United States occupied by neuropsychiatric patients compared with beds occupied by patients for all causes was greater in mid-1973 than it has ever been -- including the "psychiatric disaster" period of World War II. For better or for worse neuropsychiatric patients remain in CONUS Army hospitals for longer periods of time than they did in World War II.

The data themselves suggest a dearth of hypotheses to account for the pre-1973 sharp rise in incidence of neuropsychiatric disorder in the Army. However, two time-worn hypotheses are not well received to account for the increase: (1) personnel composition differences (since consistency is evident across all three services and since conscription was still operative during a major portion of the rise) and (2) war-time activity (since the rise was atypical of previous rate elevations in war-time -- it occurred after the main heat of the Vietnam conflict). We are left with the relatively weak hypothesis that the rising psychiatric incidence is drug-related.

5 December 1975 -- A paper from United States Army Medical Research and Development Command, Washington, D.C. while the author was on assignment to the Division of Neuropsychiatry, Walter Reed Army Institute of Research. Appreciation is expressed to Colonel Harry C. Holloway, Doctor David Marlowe, and Doctor Joseph W. Rothberg for their encouragement and helpful suggestions in preparation of the manuscript. The opinions and assertions contained in the paper are those of the author only and are not to be construed as carrying the official endorsement of agents or agencies within the Department of Defense.

FOOTNOTES

¹The data sources are available in the Document Section of the National Library of Medicine, Department of Health, Education, and Welfare, Bethesda, Maryland.

²Navy data for 1970 were made available to the author by courtesy of Statistics Division, Naval Medical Data Services Center, United States Naval Medical Center, Bethesda, Maryland.

³To enhance readability and comparability, data presented throughout this paper are in the form of plots rather than tables. The data points themselves are available from the author.

⁴The worldwide neuropsychiatric rate for 1951 reported here is markedly lower than the worldwide rate reported by Glass (1957) and echoed by Allerton and Peterson (1957). These writers report a psychiatric rate of 30.4 for the June through December seven-month period (they do not report a neuropsychiatric rate), whereas I found a psychiatric rate of 21.94 for the same period. I averaged the rates for June through December 1951 published in Health of the Army; the previously reported rate figure was apparently obtained by studying a sample of medical records (see October 1955 issue of Health of the Army).

FOOTNOTES (continued)

⁵In Figure 8 note the marked drop in the Army's incidence of character and behavior disorder from 1960 to 1961. This is artifactual. In early 1961 psychiatric cases carded for record only (CFRO) were excluded from the incidence counts. Most of the psychiatric CFRO's counted prior to 1961 were character and behavior disorders. To see the effects of this record-keeping change on the frequency of "other" mental illness diagnoses, see Figure 8a.

⁶Army strength is used as a denominator here, even though beds occupied (in the numerator) includes all persons using Army hospitals. Therefore, the percentages, while they enable comparisons over time and between diseases, cannot be interpreted as reflecting an accurate statement of bed-occupancy incidence. The actual Army strength figures used are plotted in Figure 30.

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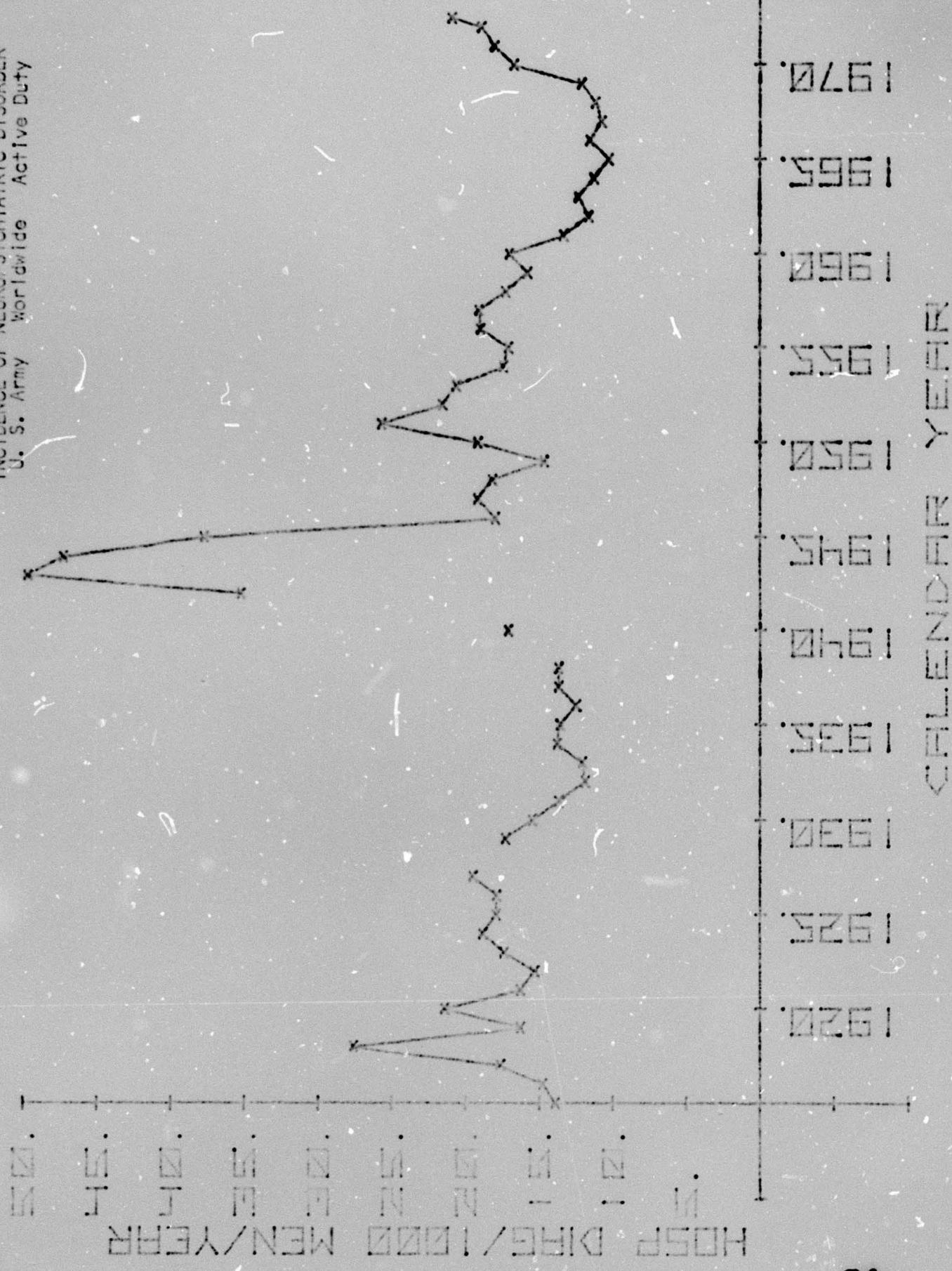
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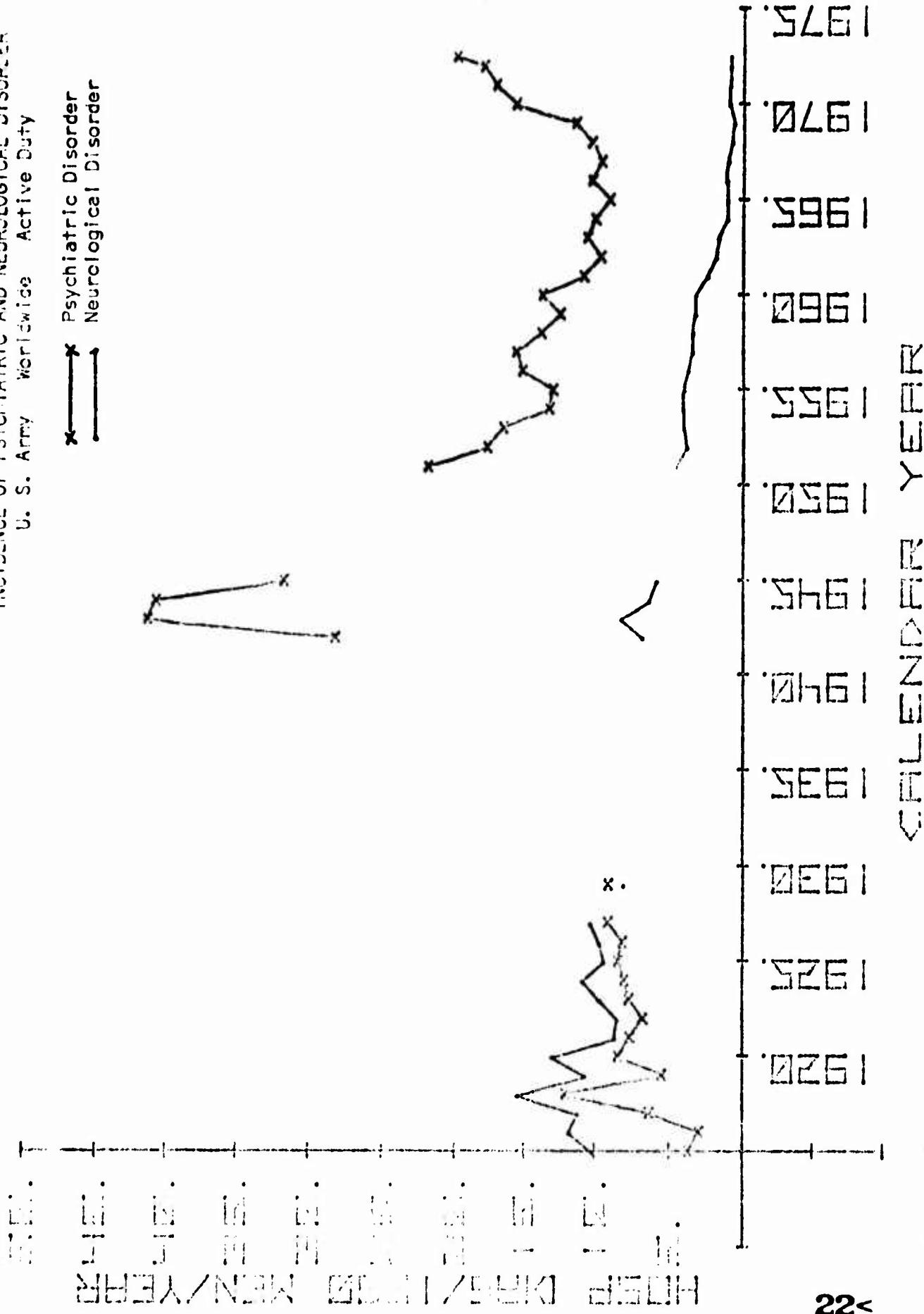
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INCIDENCE OF NEUROPSYCHIATRIC DISORDER
U. S. Army Worldwide Active Duty

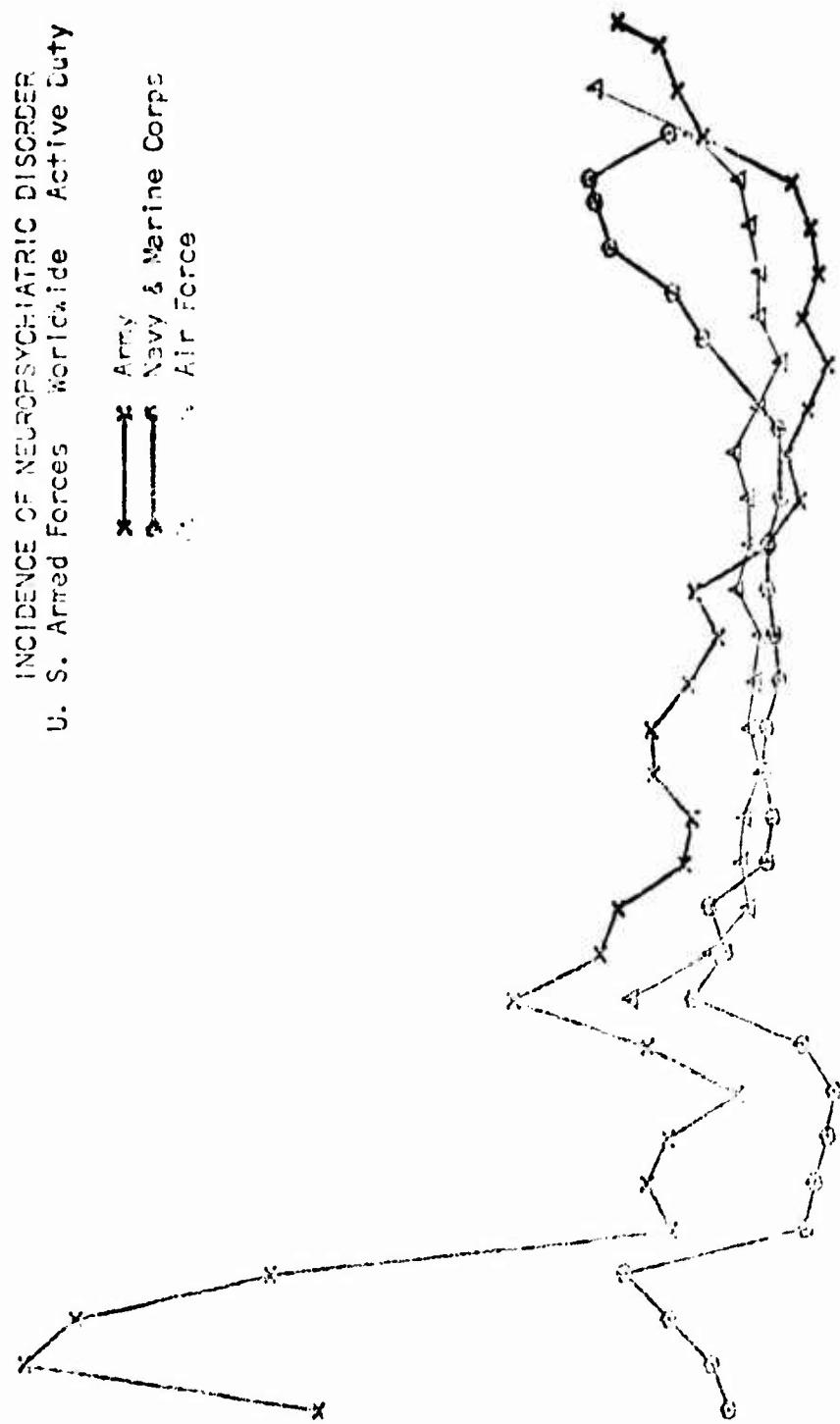


INCIDENCE OF PSYCHIATRIC AND NEUROLOGICAL DISORDER
U. S. Army Worldwide Active Duty

Psychiatric Disorder
Neurological Disorder



INCIDENCE OF NEUROPSYCHIATRIC DISORDER
U. S. Armed Forces Worldwide Active Duty



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INCIDENCE OF PSYCHIATRIC DISORDER
 U. S. Armed Forces Worldwide Active Duty

Army X
 Navy & Marine Corps O
 Air Force ▲

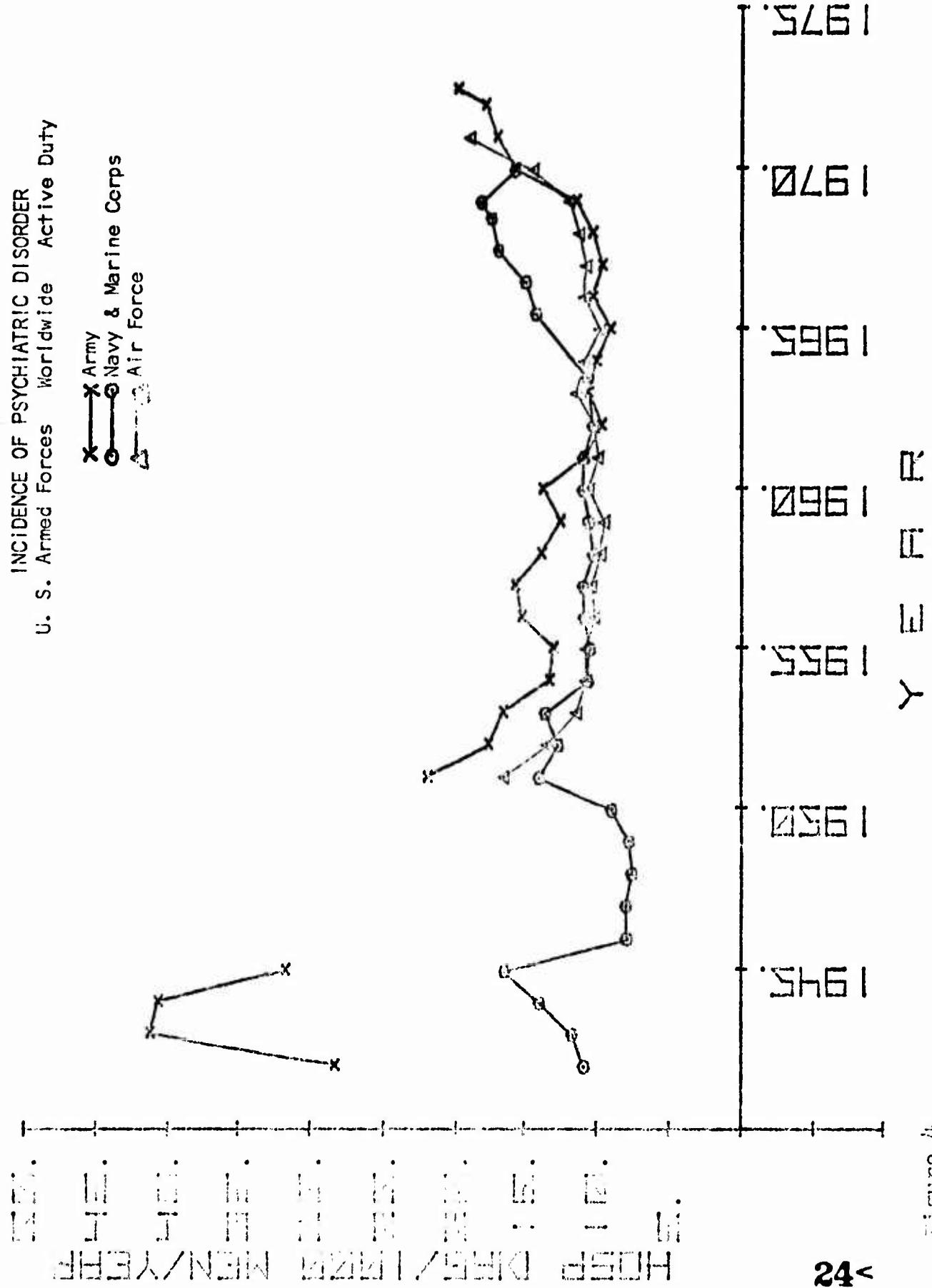
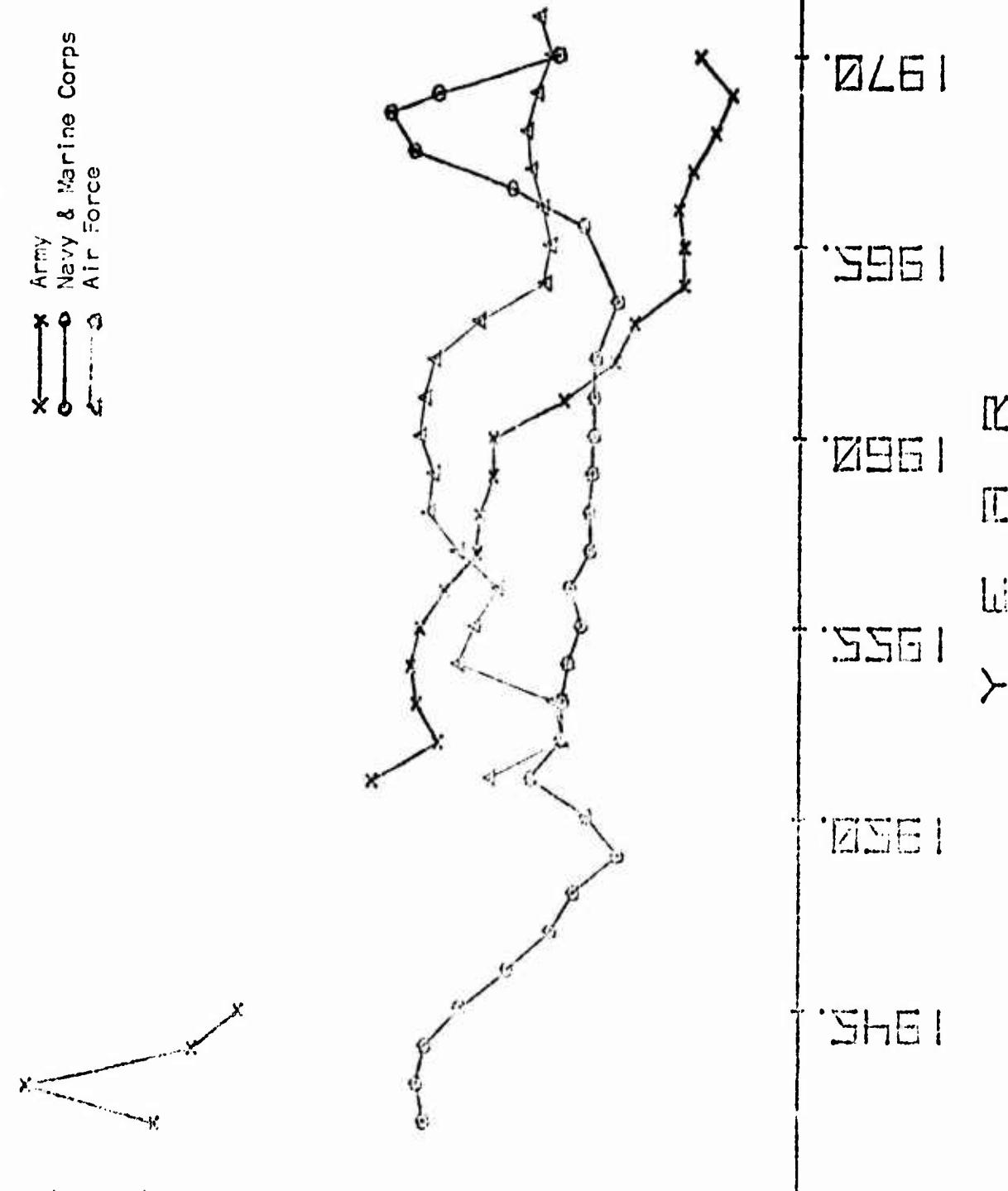


Figure 4

INCIDENCE OF NEUROLOGICAL DISORDER
U. S. Armed Forces Worldwide Active Duty

Army X
Navy & Marine Corps O
Air Force ▲

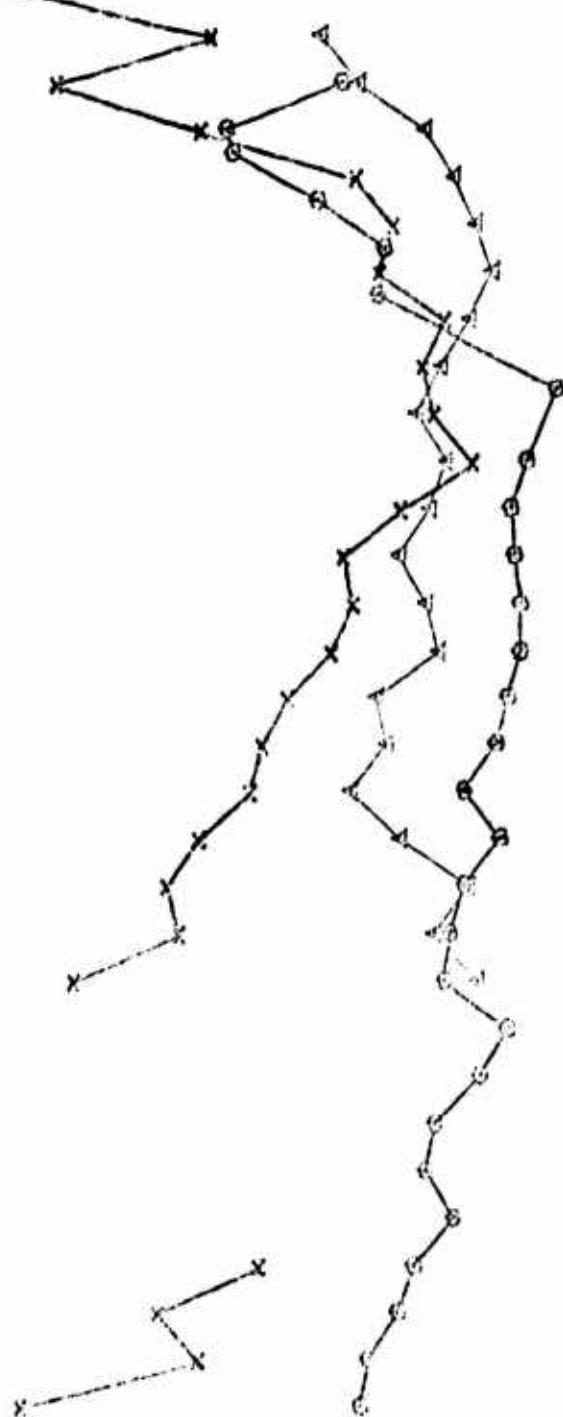


ARMED FORCES WORLDWIDE

INCIDENCE OF PSYCHOSIS
U. S. Armed Forces Worldwide Active Duty

Legend:

- Army (X)
- Navy & Marine Corps (O)
- Air Force (triangle)



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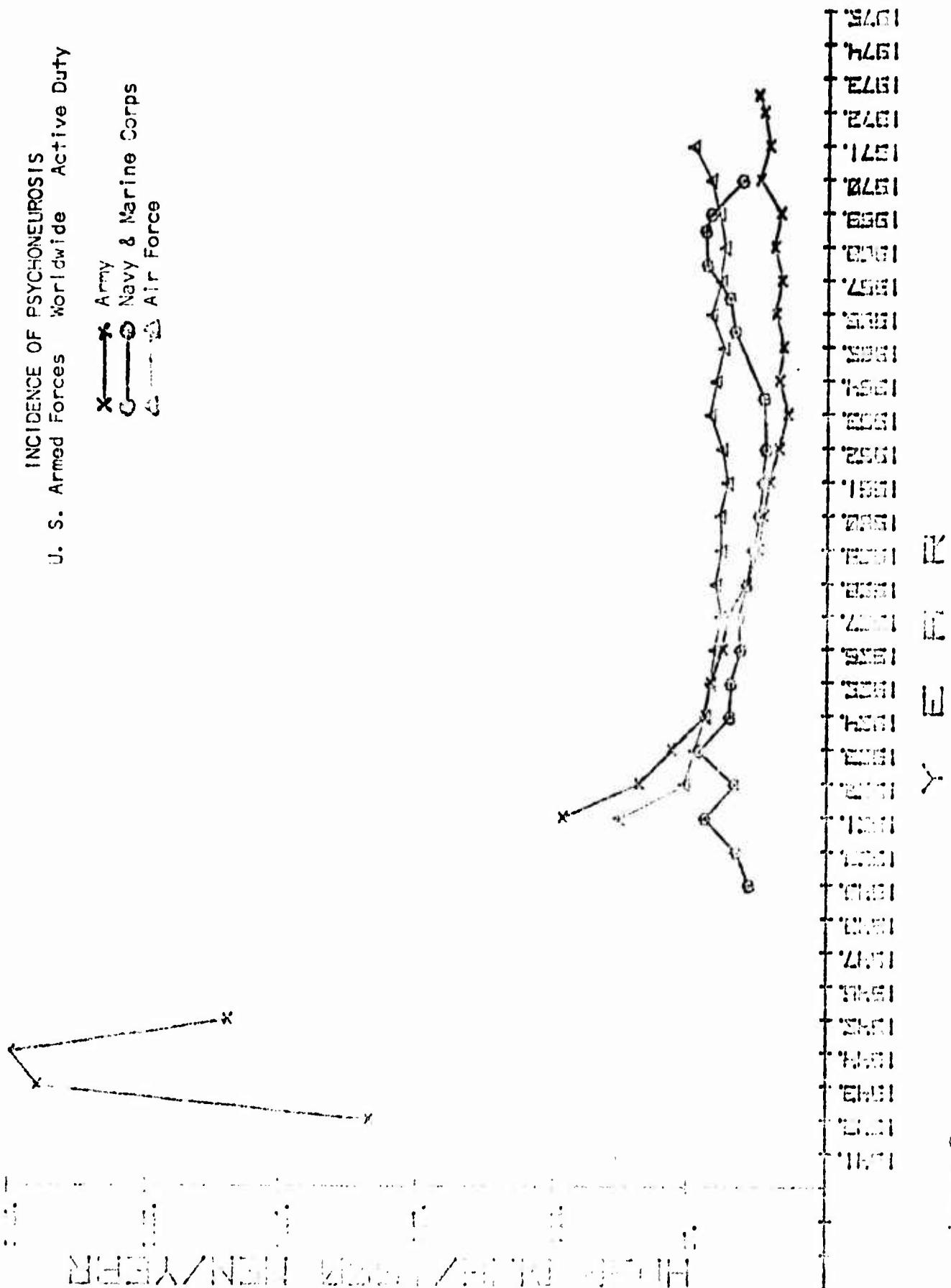
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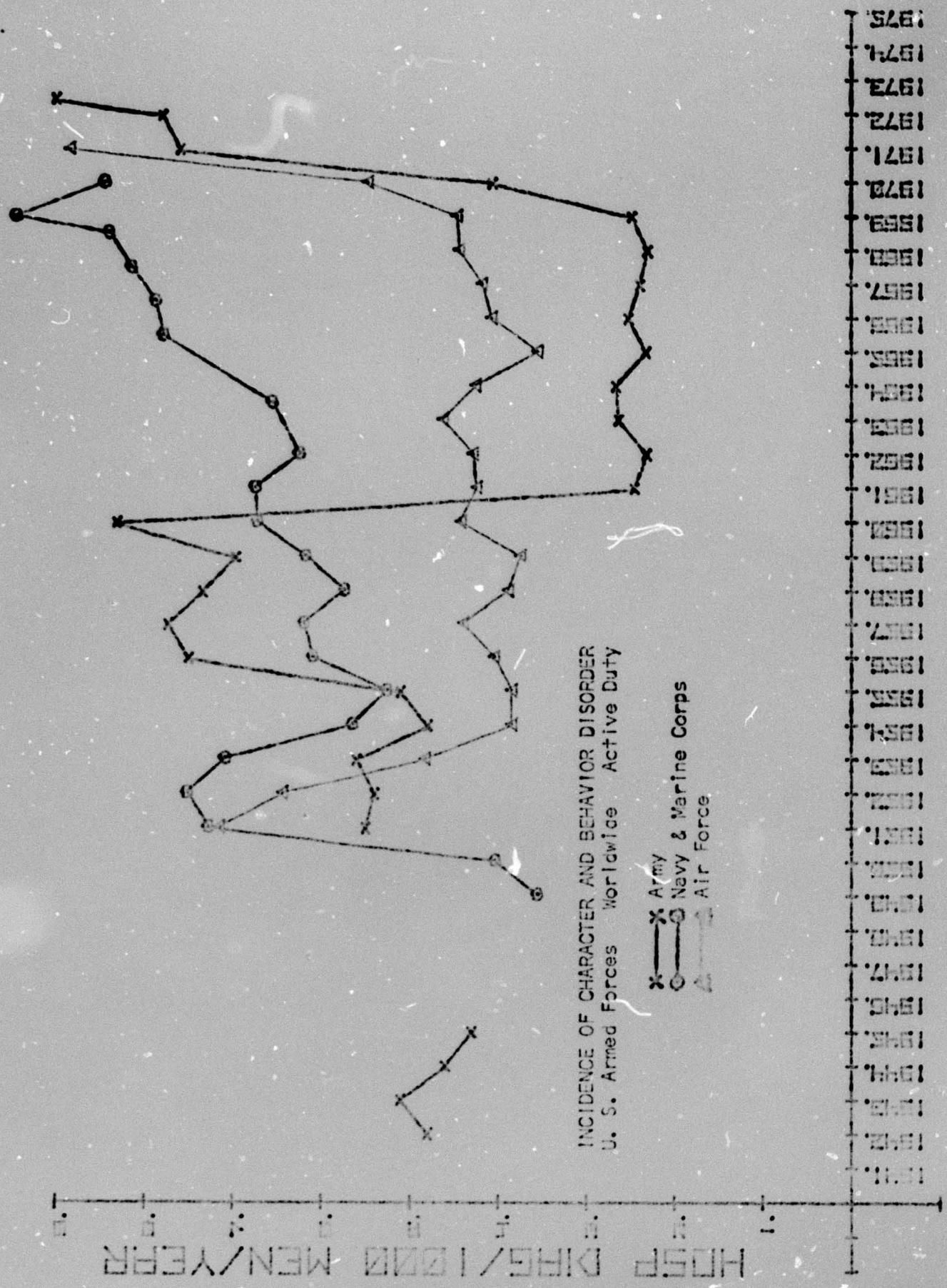
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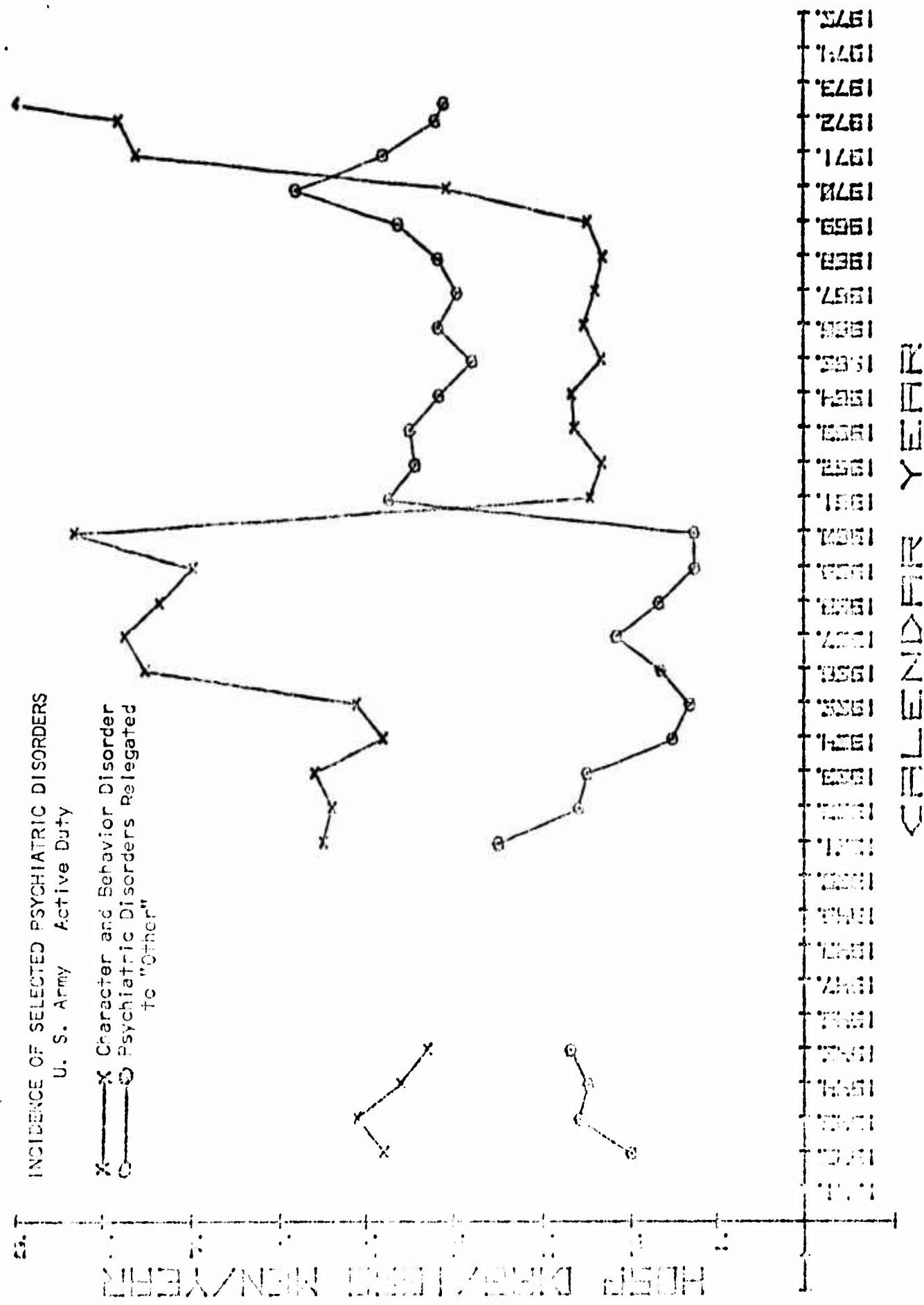
INCIDENCE OF PSYCHONEUROSIS

U. S. Armed Forces

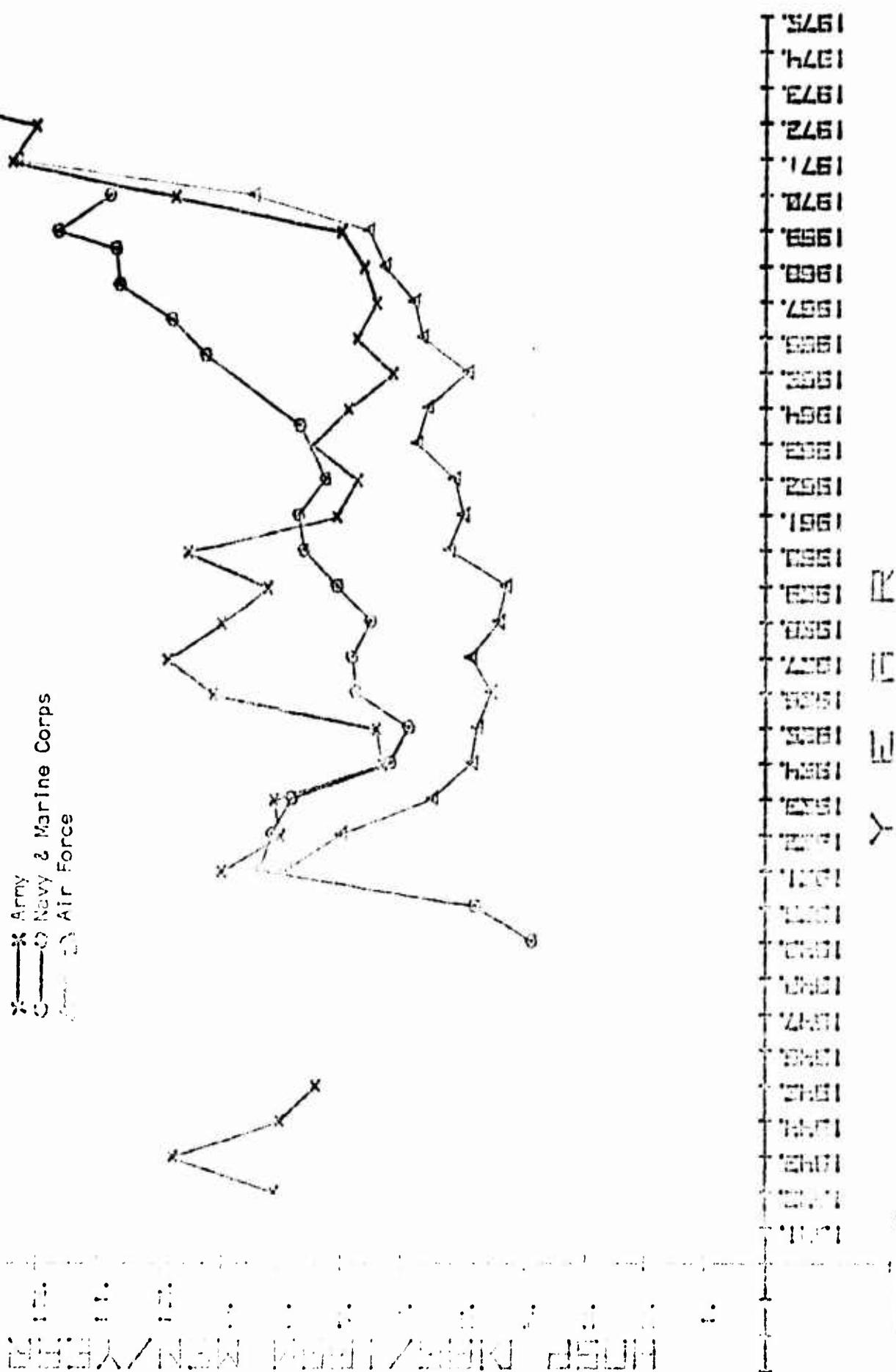
The diagram consists of four horizontal lines. The first line is solid and ends with a black arrowhead pointing right, labeled 'Army'. The second line is solid and ends with a black circle containing a white arrowhead pointing right, labeled 'Navy & Marine Corps'. The third line is dashed and ends with a black circle containing a white arrowhead pointing right, labeled 'Air Force'.





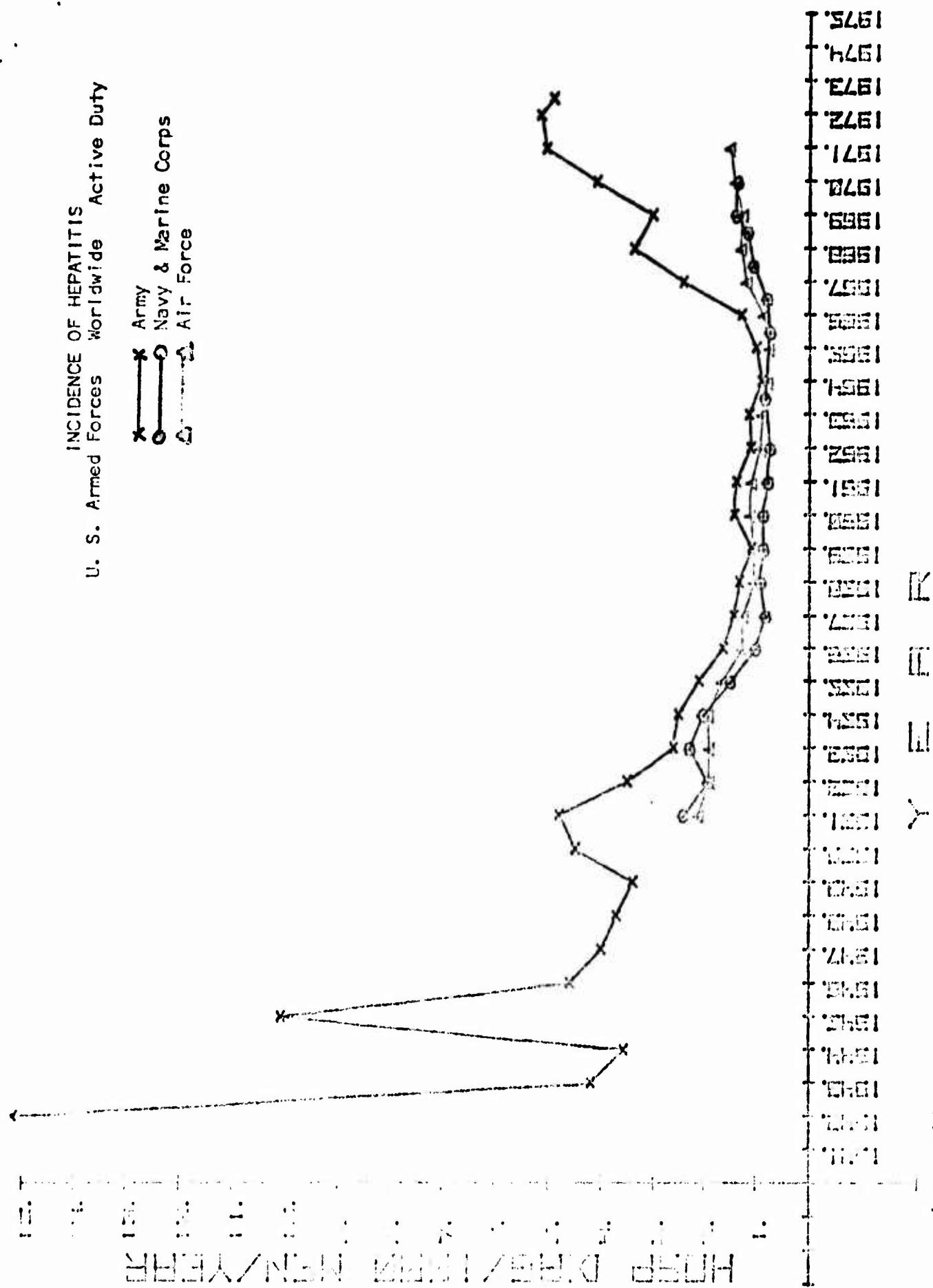


INCIDENCE OF PSYCHIATRIC DISORDER EXCLUDING
PSYCHOSIS AND PSYCHONEUROSES
U. S. Armed Forces Worldwide Active Duty



U. S. Armed Forces Worldwide Active Duty
INCIDENCE OF HEPATITIS

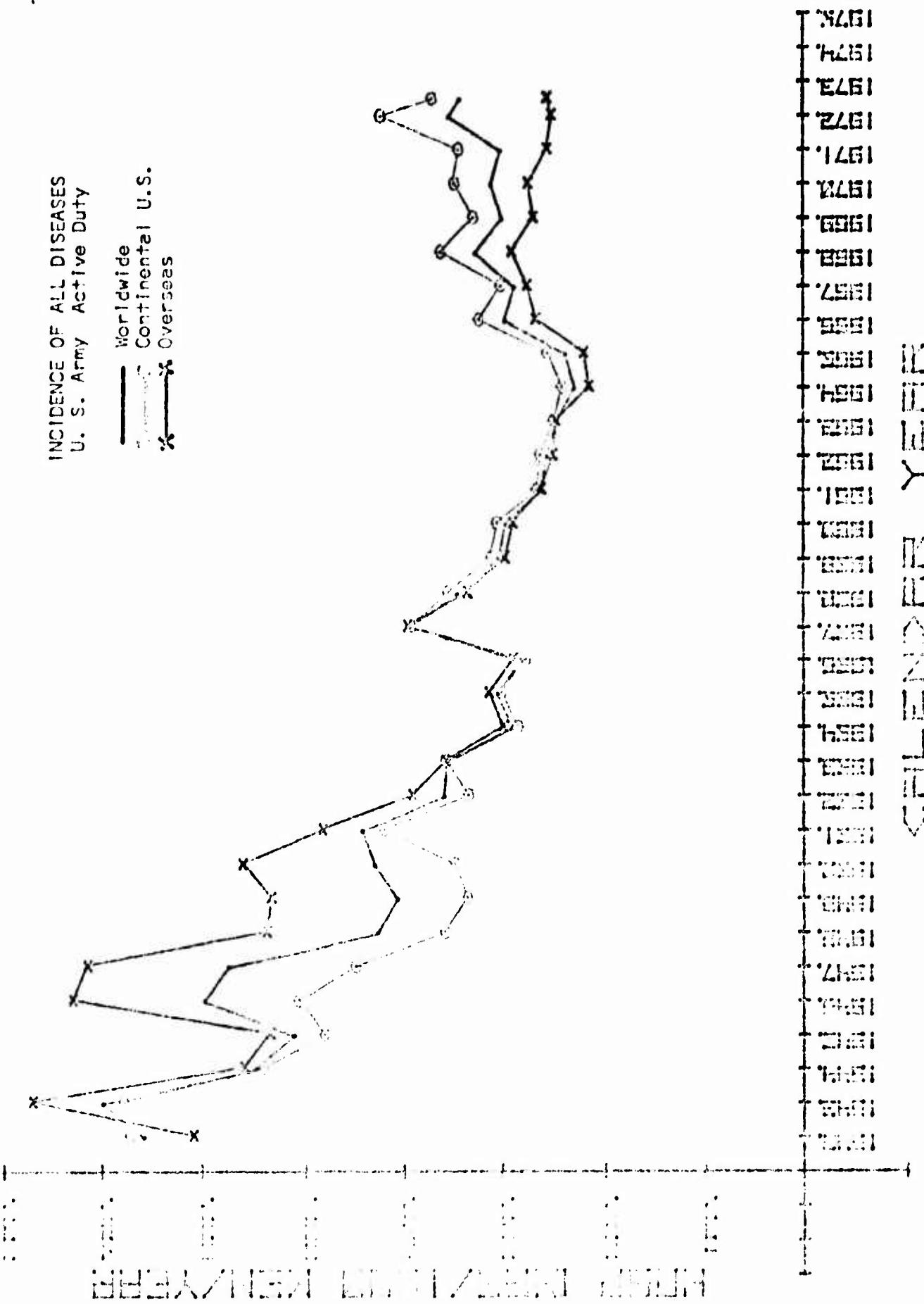
Army Navy & Marine Corps
 Air Force



HEPATITIS INCIDENCE RATE

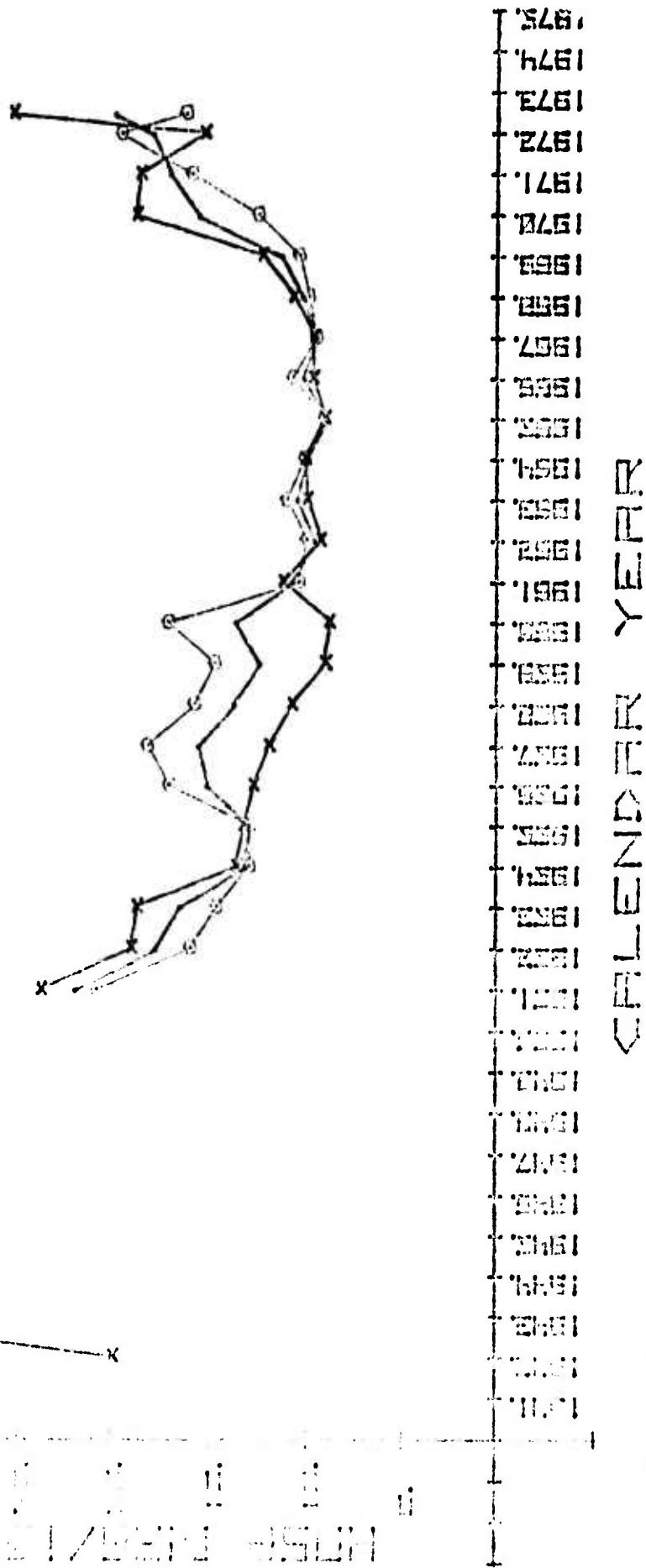
INCIDENCE OF ALL DISEASES
U. S. Army Active Duty

— Worldwide
— Continental U.S.
— Overseas



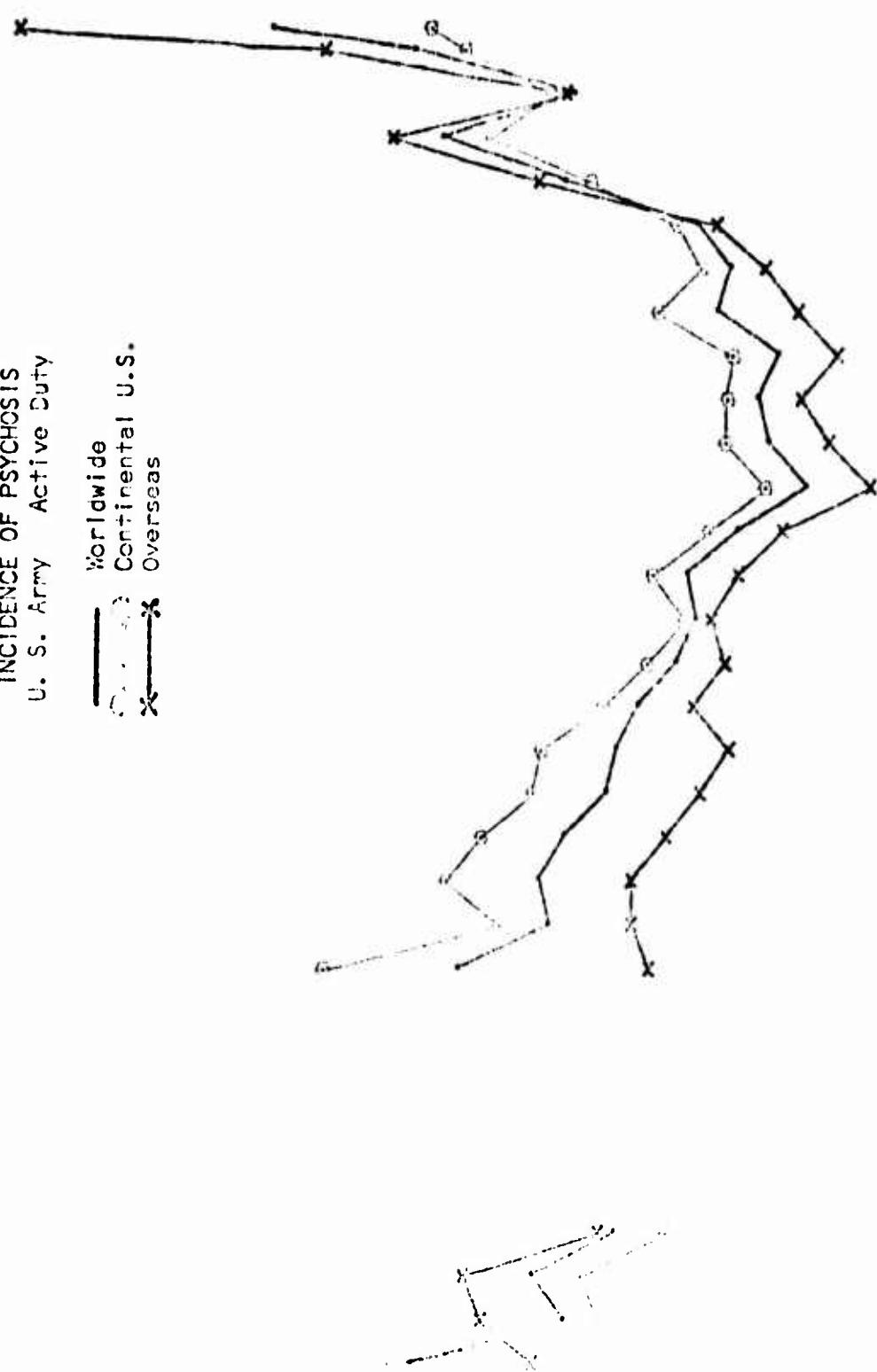
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INCIDENCE OF PSYCHOSIS
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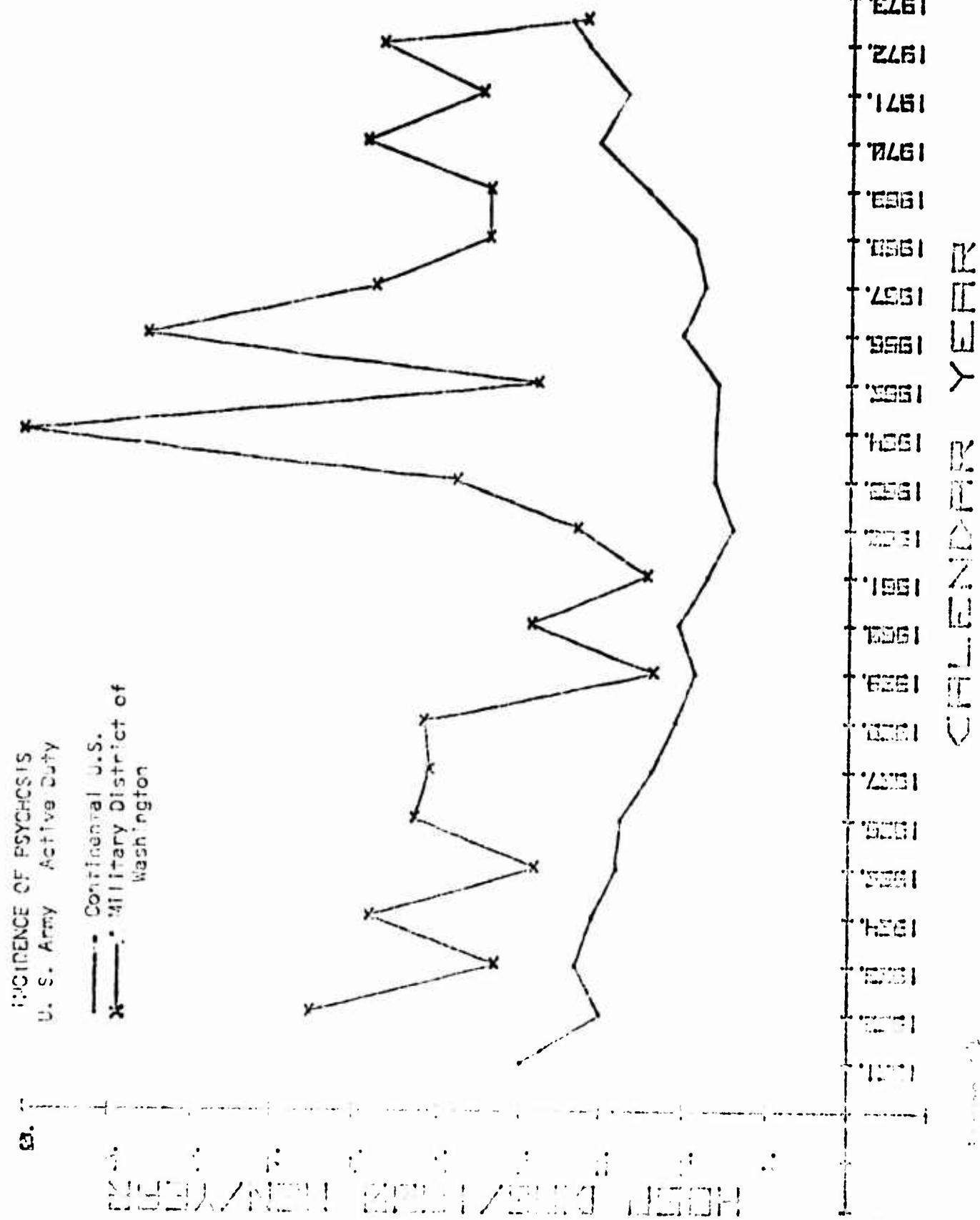
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INCIDENCE OF PSYCHOSIS
U. S. Army Active Duty

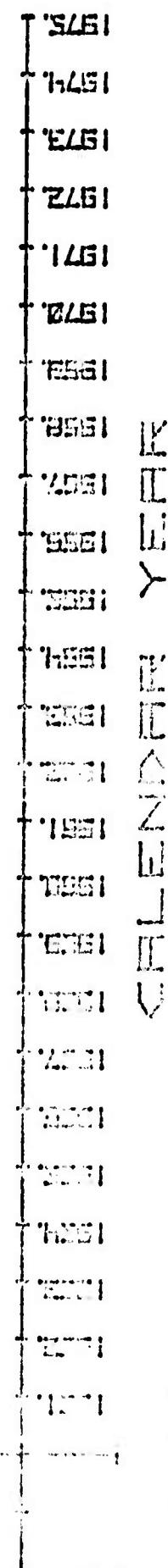
Continental U.S.
Military District of
Washington



INCIDENCE OF PSYCHOSIS
U. S. Army Active Duty

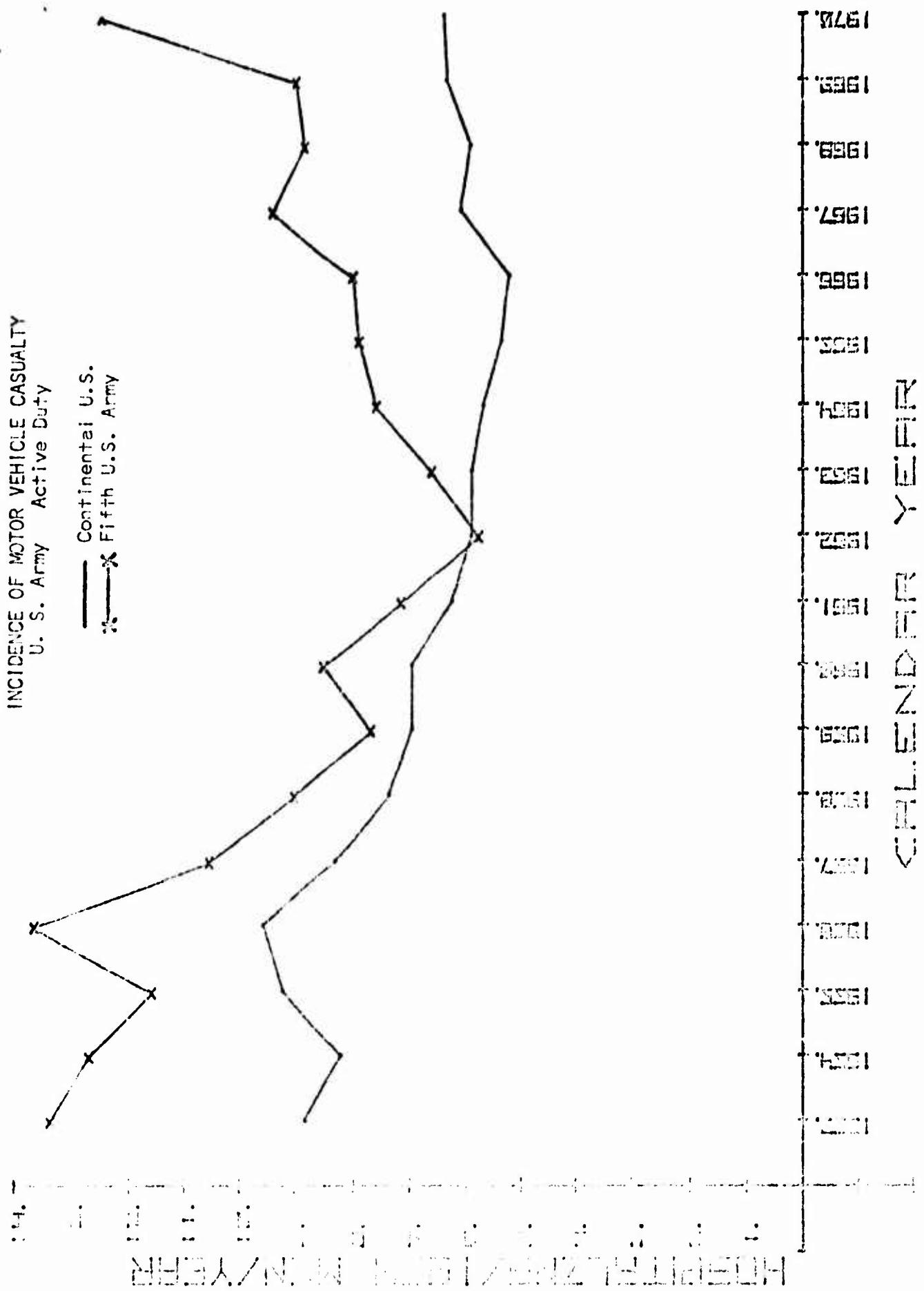
— Continental U.S.
X Sixth U.S. Army

MEAN NUMBER OF CASES



INCIDENCE OF MOTOR VEHICLE CASUALTY
U. S. Army Active Duty

— Continental U.S.
X Fifth U.S. Army



INCIDENCE OF MOTOR VEHICLE CASUALTY
U. S. Army Active Duty

Overseas
Europe

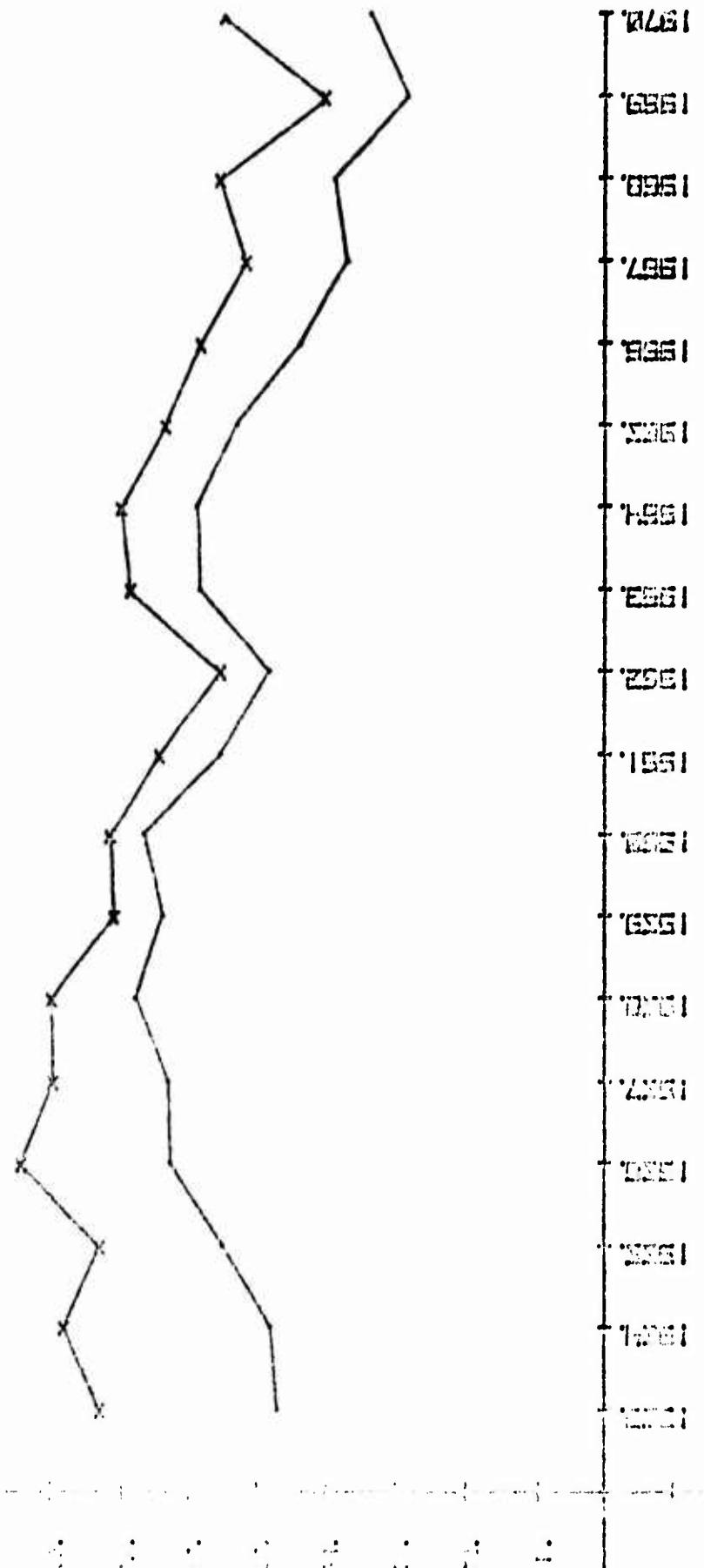
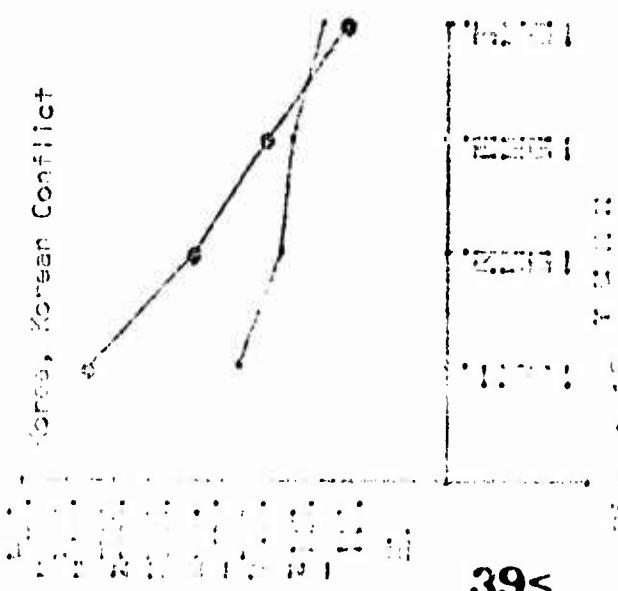
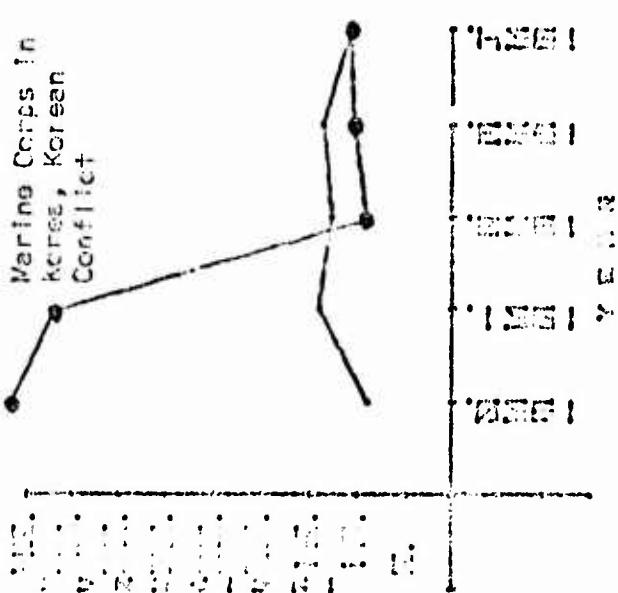
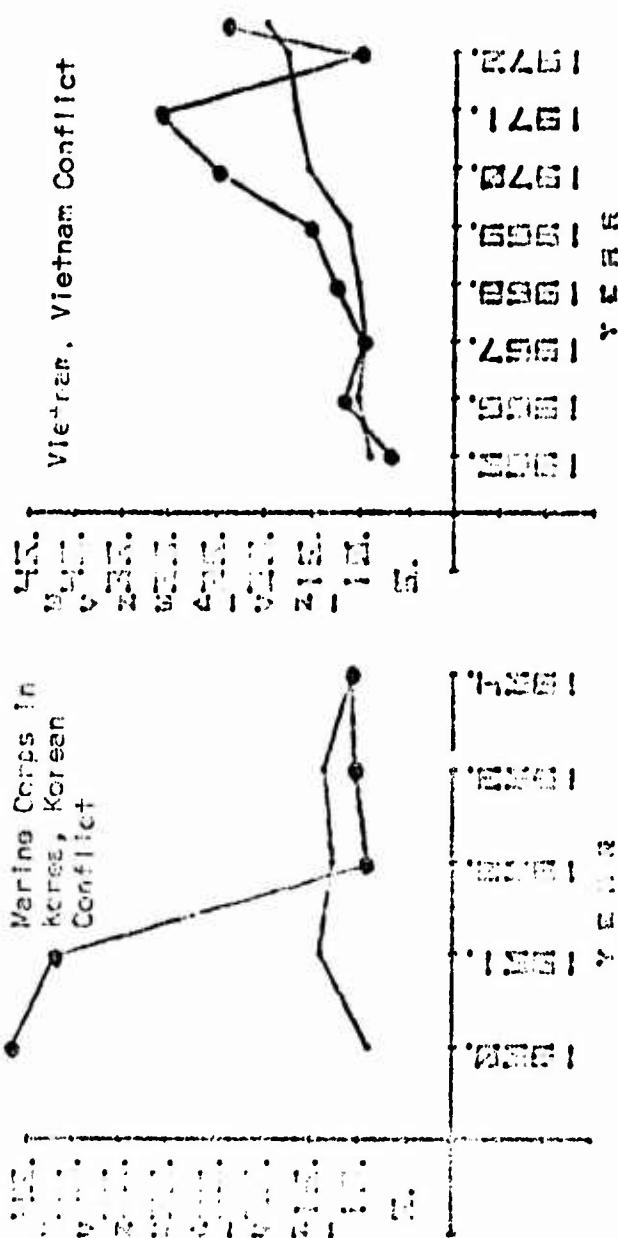
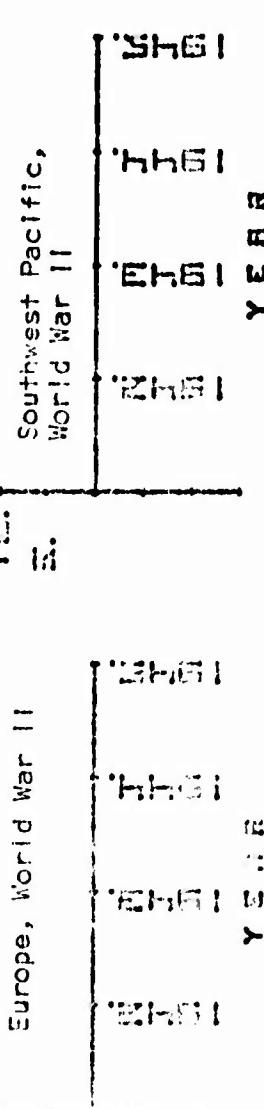
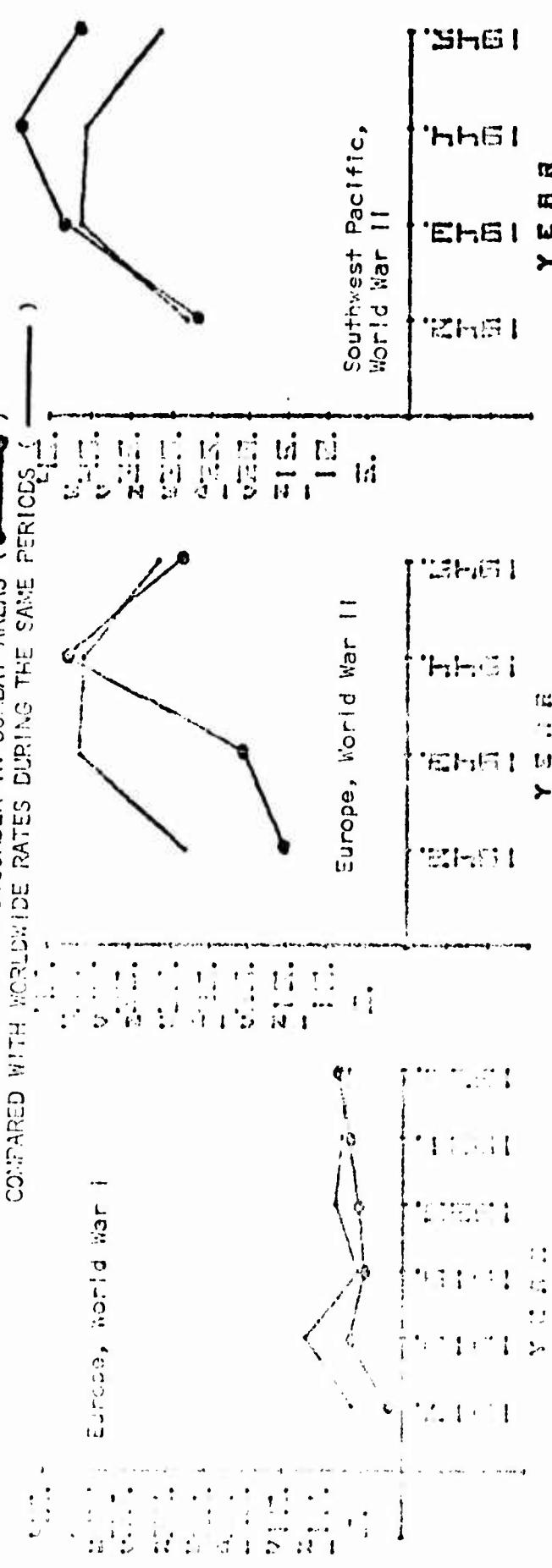


CHART END FOR YEAR

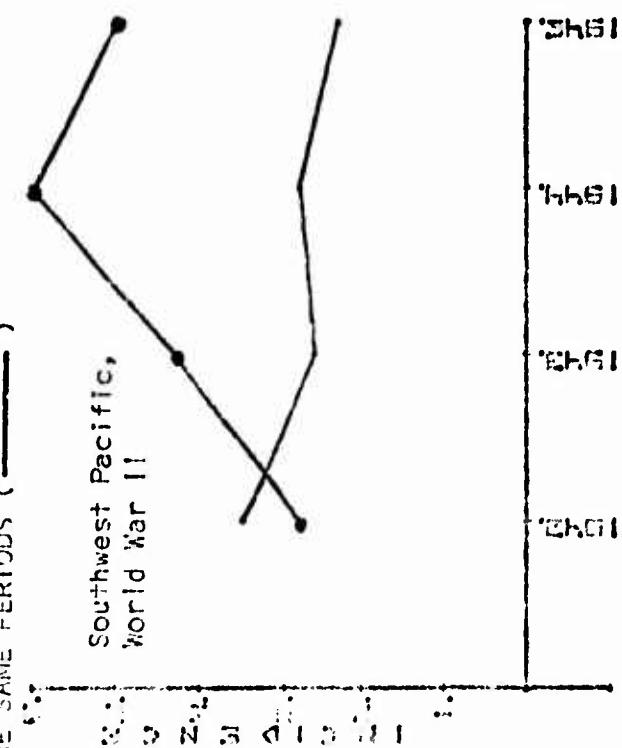
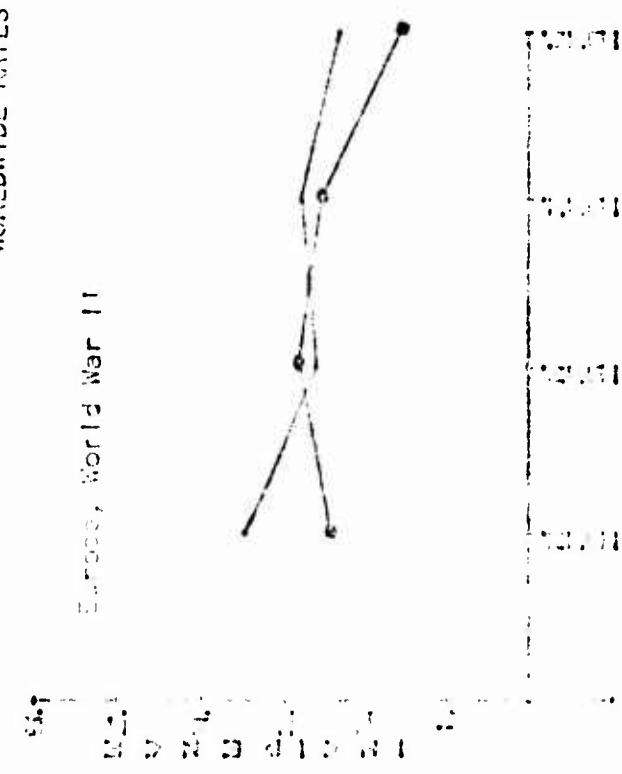
12 June 67

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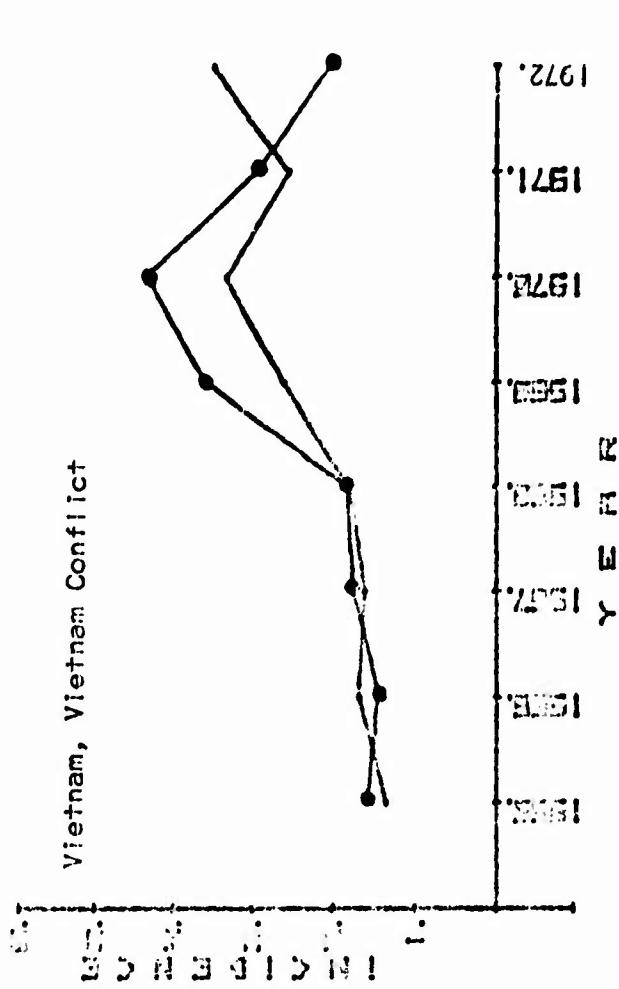
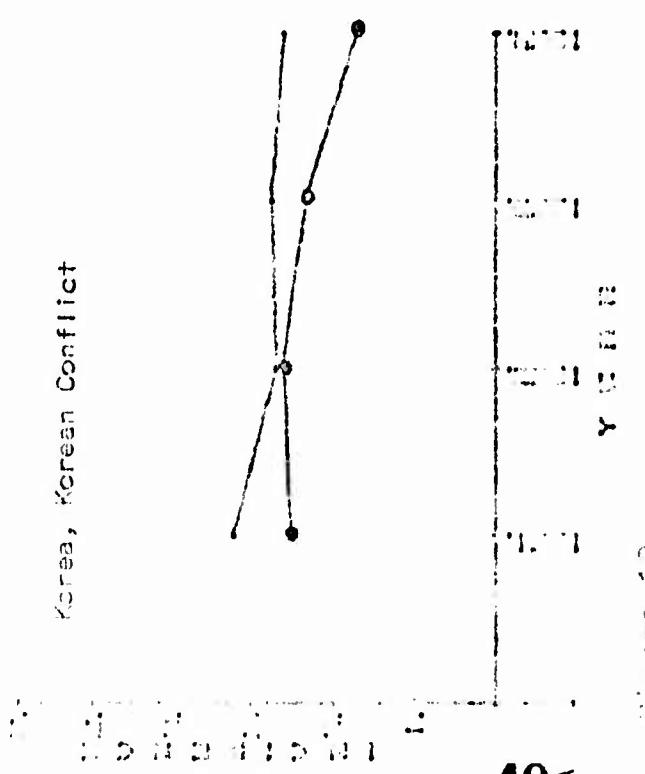
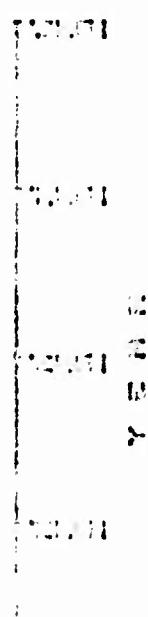
PSYCHIATRIC DISORDER IN COMBAT AREAS ()
COMPARED WITH WORLDWIDE RATES DURING THE SAME PERIODS (—)



PSYCHOSIS IN COMBAT AREAS (—●—) COMPARED WITH
WORLDWIDE RATES DURING THE SAME PERIODS (—X—)

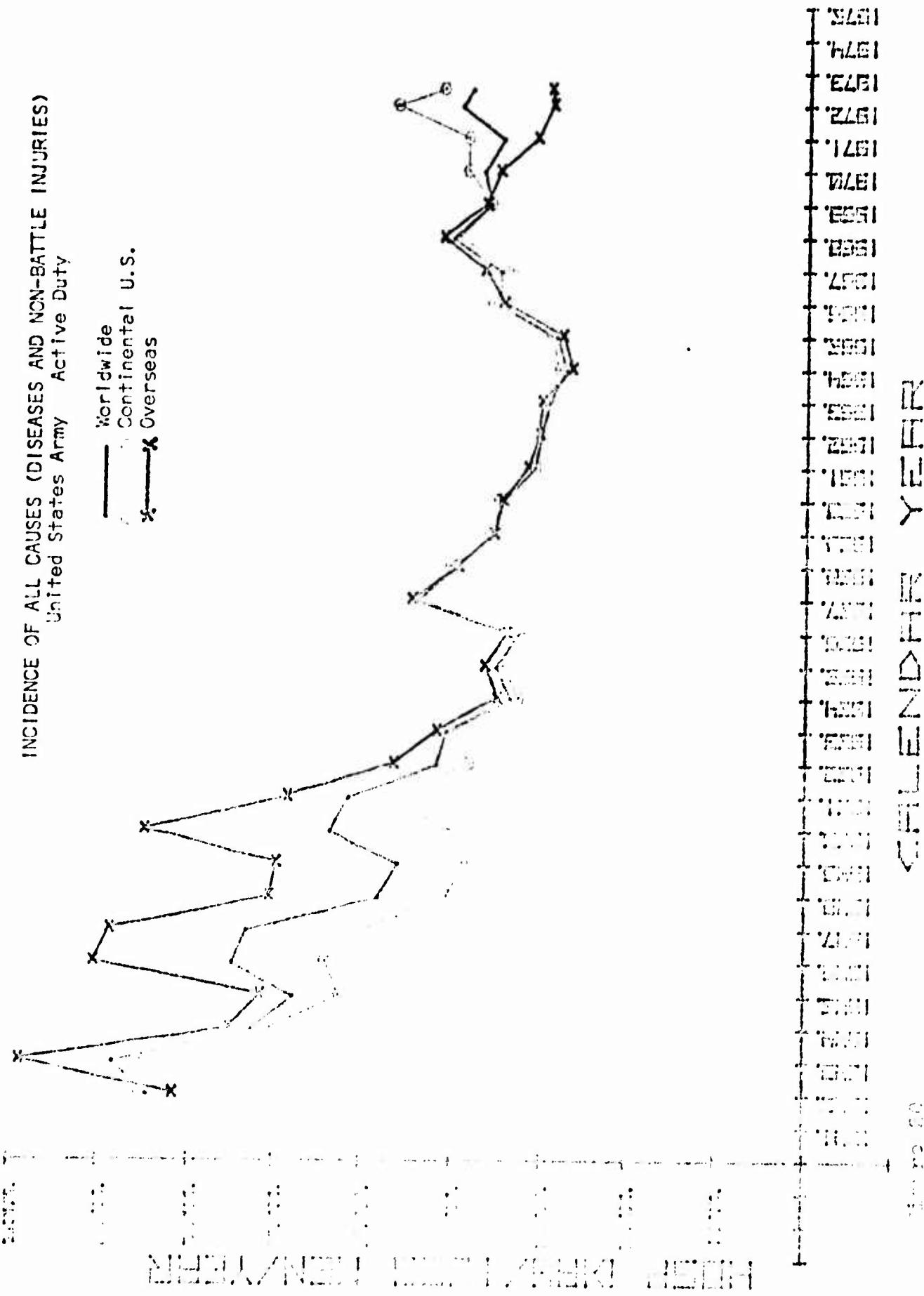


Korea, Korean Conflict



INCIDENCE OF ALL CAUSES (DISEASES AND NON-BATTLE INJURIES)
United States Army Active Duty

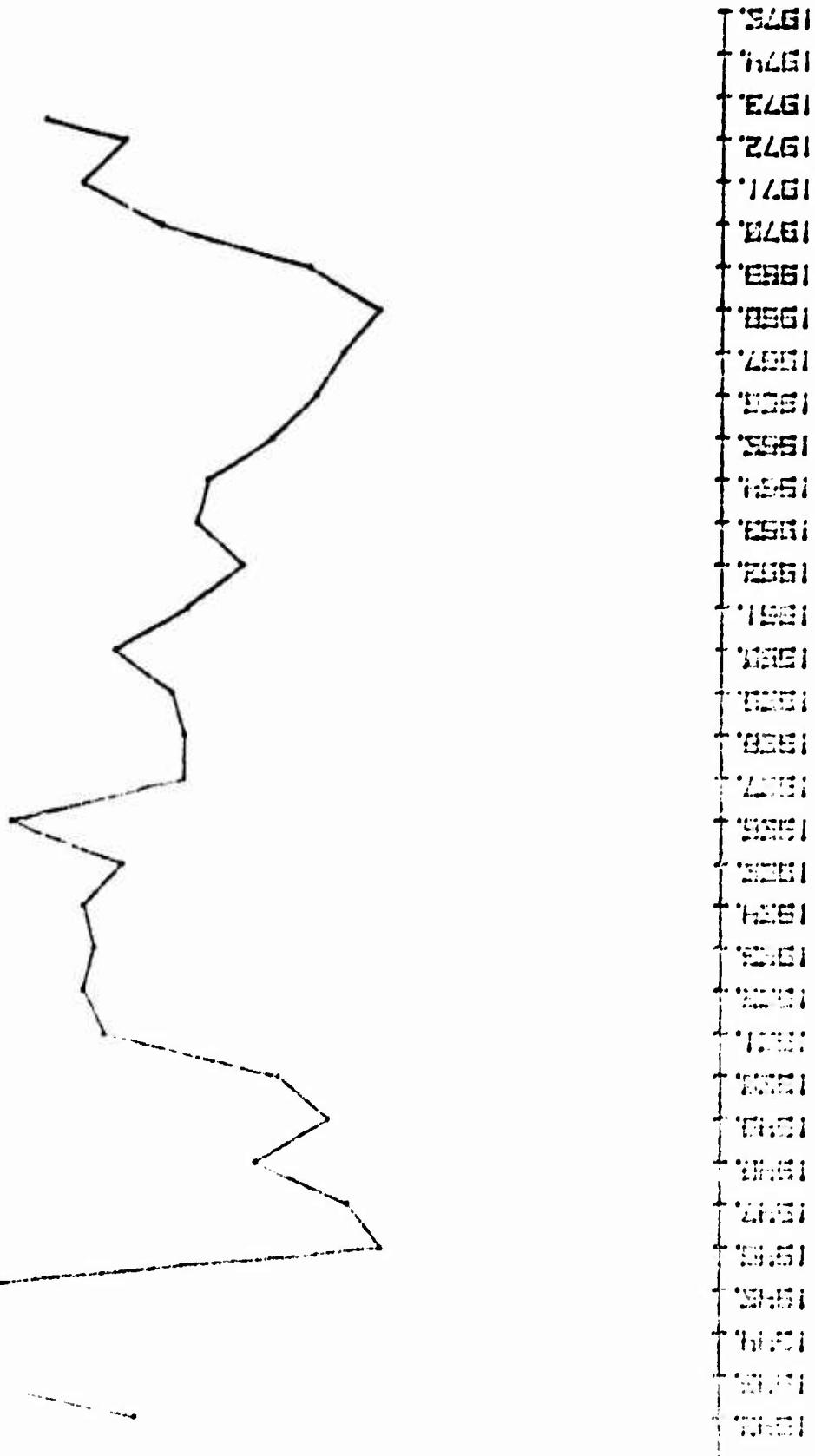
— Worldwide
— Continental U.S.
— X Overseas



INCIDENCE: PER CENT NEUROPSYCHIATRIC RATE OF RATE FOR ALL CAUSES
United States Army Active Duty Worldwide

2.7

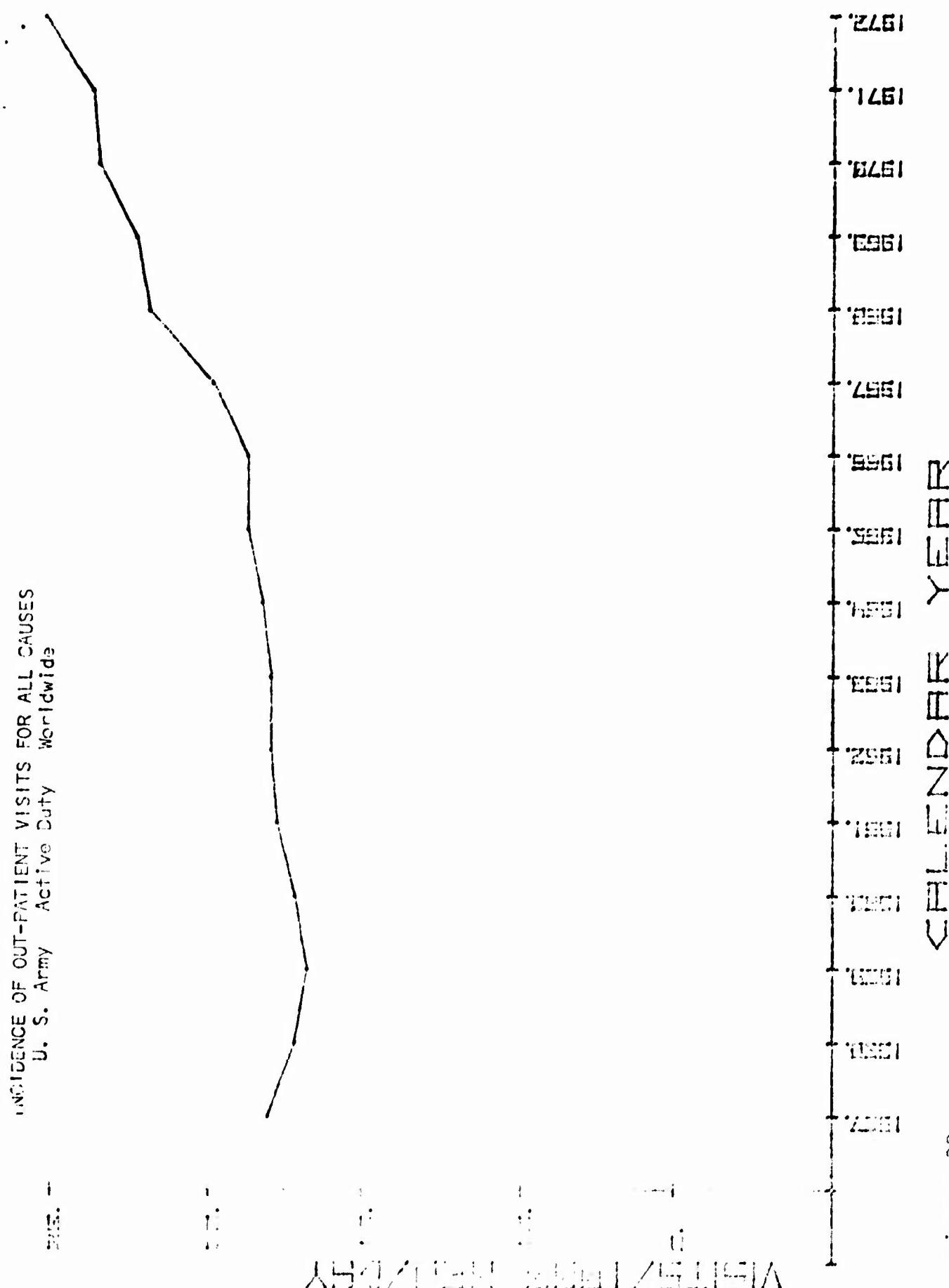
DISBURSEMENT LINE



CHIEN DYE YEAR

INCIDENCE OF OUT-PATIENT VISITS FOR ALL CAUSES
U. S. Army Active Duty Worldwide

FIG. -



ARMED FORCES MEDICAL LIBRARY

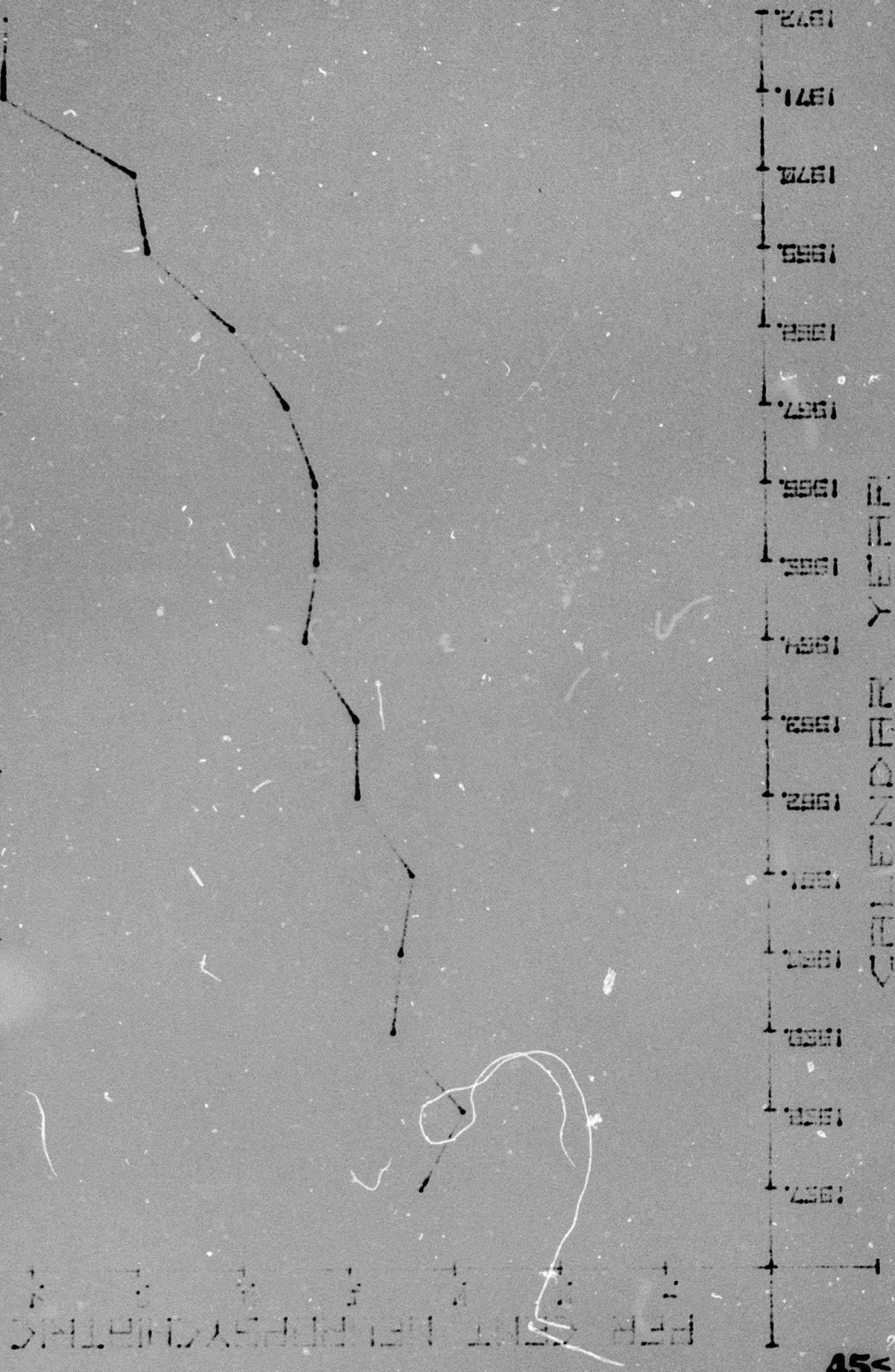
INCIDENCE OF NEUROPSYCHIATRIC OUT-PATIENT VISITS U. S. Army Active Duty Worldwide

44<

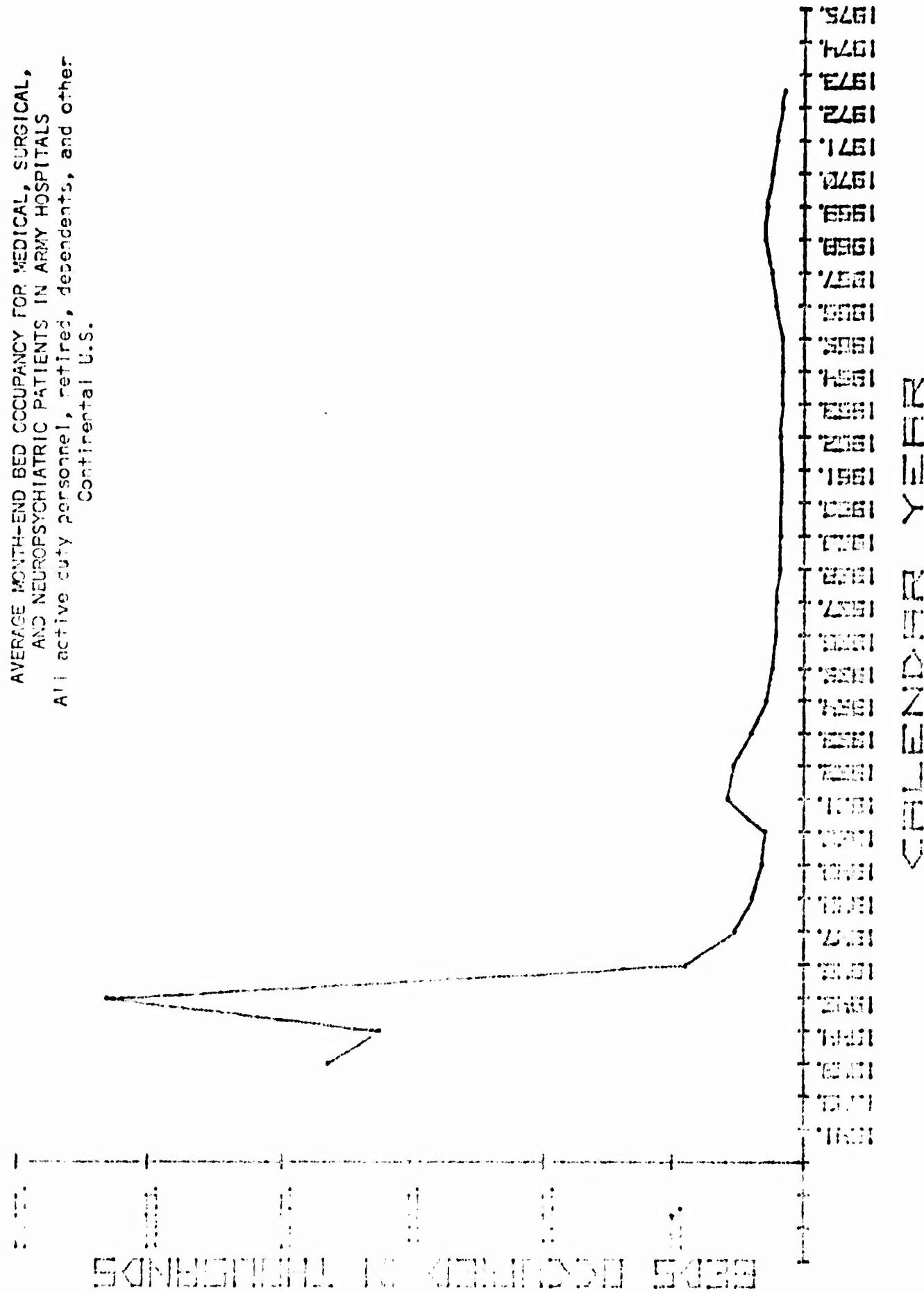
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INCIDENCE: PER CENT NEUROPSYCHIATRIC OUT-PATIENT VISIT RATE
OF OUT-PATIENT VISIT RATE FOR ALL CAUSES
U. S. Army Active Duty Worldwide

Reported from
Psychiatric Corp.

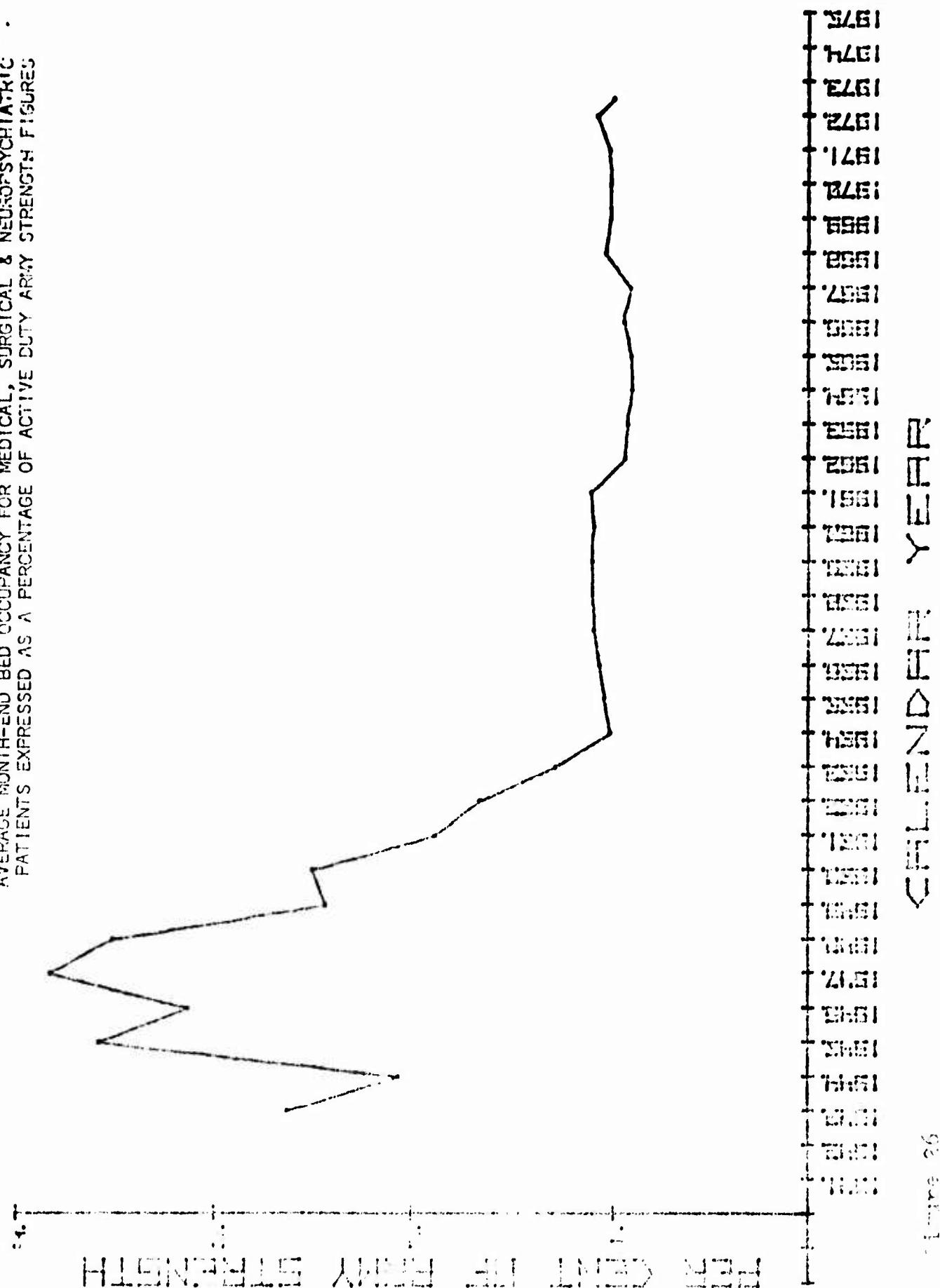


AVERAGE MONTH-END BED OCCUPANCY FOR MEDICAL, SURGICAL,
AND NEUROPSYCHIATRIC PATIENTS IN ARMY HOSPITALS
All active duty personnel, retired, dependents, and other
Contingent U.S.



SKETCHED BY ARTHUR D. GIBB

AVERAGE MONTH-END BED OCCUPANCY FOR MEDICAL, SURGICAL & NEUROPSYCHIATRIC PATIENTS EXPRESSED AS A PERCENTAGE OF ACTIVE DUTY ARMY STRENGTH FIGURES

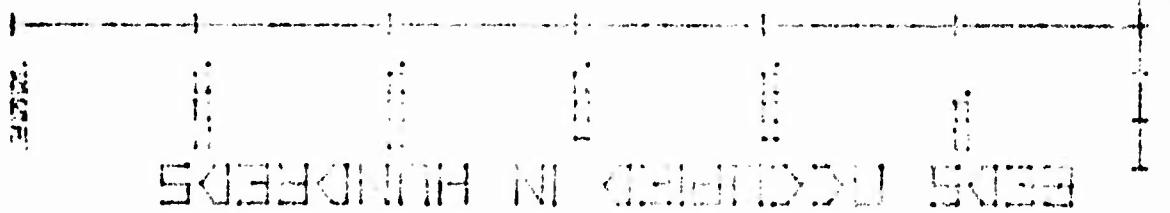


4. T

HEALTH CARE AND MEDICAL CARE

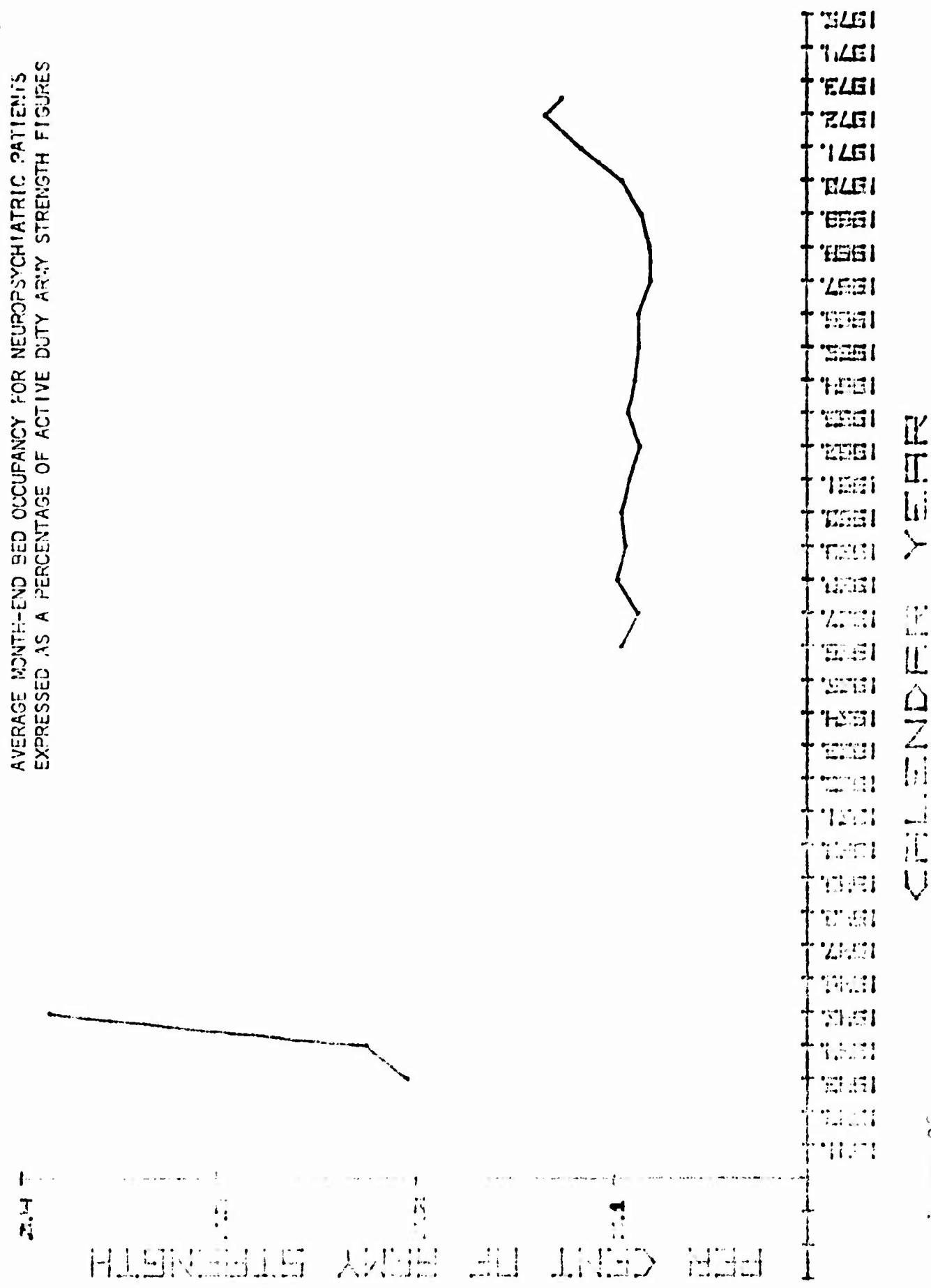
47A

AVERAGE MONTH-END BED OCCUPANCY
FOR NEUROPSYCHIATRIC PATIENTS IN ARMY HOSPITALS
All active duty personnel, retired, dependents, and other
Contingent U.S.



48A

AVERAGE MONTH-END BED OCCUPANCY FOR NEUROPSYCHIATRIC PATIENTS EXPRESSED AS A PERCENTAGE OF ACTIVE DUTY ARMY STRENGTH FIGURES





3. T

1951

1952

Month-End Bed Occupancy (Per Cent Neuropsychiatric of Medical, Surgical and Neuropsychiatric)

MONTH-END BED OCCUPANCY: PER CENT NEUROPSYCHIATRIC OF
MEDICAL, SURGICAL AND NEUROPSYCHIATRIC
All Active Duty Personnel, Retired, Dependents, and Other
Continental U.S.

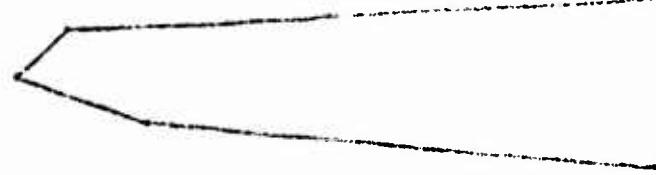
Month-End Bed Occupancy

1951-52

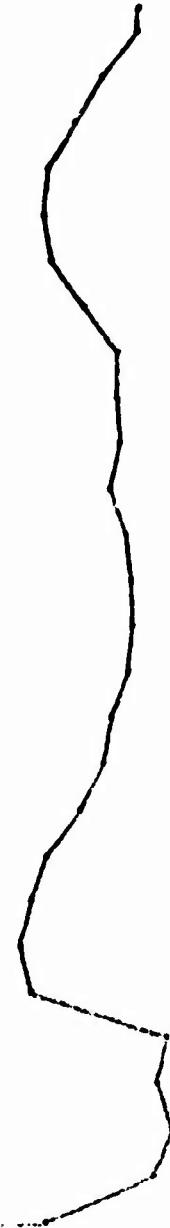
50%

ESTIMATE OF AVERAGE STRENGTH
U. S. Army Active Duty Worldwide

1920-33



Estimated in Millions



CHILENDH YEAR

TABLE 1,2
Data Points for Figure 1 and for Figure 2

YEAR	NP	Neuro	Psych	YEAR	NP	Neuro	Psych
1915	13.95	10.29	3.66	1950	19.20	—	21.94
16	14.78	11.87	2.91	51	25.70	4.60	17.68
17	17.66	11.31	6.35	52	21.57	3.89	16.52
18	27.59	15.53	12.06	53	20.64	4.12	13.25
19	16.30	10.78	5.52	54	17.43	4.18	12.99
1920	21.44	13.03	8.41	55	17.07	4.08	15.17
21	16.31	8.73	7.58	56	18.99	3.82	15.62
22	15.32	8.55	6.77	57	19.10	3.48	13.81
23	17.40	9.77	7.66	58	17.26	3.45	12.50
24	18.84	10.90	7.97	59	15.80	3.30	13.72
25	17.94	9.54	8.40	1960	17.02	3.30	10.84
26	17.91	9.80	8.11	61	13.35	2.51	9.69
27	19.52	10.39	9.13	62	11.65	1.75	10.58
28	—	—	—	63	12.33	1.22	10.04
29	17.30	8.14	9.14	64	11.26	1.22	9.05
1930	15.50	—	—	65	10.27	1.28	10.26
31	13.70	—	—	66	11.54	1.13	9.63
32	11.90	—	—	67	10.76	.89	10.29
33	12.10	—	—	68	11.18	.72	11.39
34	13.80	—	—	69	12.11	1.06	15.64
35	13.60	—	—	1970	16.70	(1.00)	17.01
36	12.50	—	—	71	18.01	(1.00)	17.91
37	13.70	—	—	72	18.91	(1.00)	19.90
38	13.70	—	—	72.5	20.70	—	—
39	—	—	—	—	—	—	—
1940	17.10	—	—	—	—	—	—
41	—	—	—	—	—	—	—
42	35.20	6.90	28.30	—	—	—	—
43	49.60	8.30	41.30	—	—	—	—
44	47.20	6.50	40.70	—	—	—	—
45	37.70	6.00	31.70	—	—	—	—
46	18.00	—	—	—	—	—	—
47	19.20	—	—	—	—	—	—
48	18.20	—	—	—	—	—	—
49	14.70	—	—	—	—	—	—

TABLE 3, 4, 5
DATA POINTS for Figure 3, Figure 4 and Figure 5

YEAR	NP			NERO			PSY'TRIC		
	ARMY	NAVY	A.F.	ARMY	NAVY	A.F.	ARMY	NAVY	A.F.
1942	35.20	14.96		6.90	4.01		28.30	10.95	
43	49.60	15.84		8.30	4.09		41.30	11.75	
44	47.20	19.00		6.50	4.00		40.70	14.00	
45	37.70	20.13		6.00	3.63		31.70	16.50	
46	18.00	11.06		—	3.11		—	7.95	
47	19.20	10.63		—	2.62		—	8.01	
48	18.20	9.99		—	2.38		—	7.61	
49	14.70	9.70		—	1.90		—	7.80	
1950	19.20	11.29		—	2.24		—	9.05	
51	25.70	16.88	19.92	4.60	2.84	3.33	21.94	14.04	16.59
52	21.57	15.26	16.05	3.89	2.51	2.51	17.68	12.75	13.54
53	20.64	16.10	14.10	4.12	2.50	2.61	16.52	13.63	11.49
54	17.43	13.13	14.50	4.18	2.44	3.67	13.25	10.69	10.83
55	17.07	12.85	14.33	4.08	2.30	3.50	12.99	10.55	10.83
56	18.99	13.33	13.49	3.82	2.42	3.24	15.17	10.91	10.25
57	19.10	13.17	14.11	3.48	2.20	3.68	15.62	10.97	10.43
58	17.26	12.51	13.82	3.45	2.21	3.99	13.81	10.30	9.83
59	15.80	12.80	13.54	3.30	2.18	3.94	12.50	10.62	9.60
1960	17.02	13.16	14.75	3.30	2.16	4.08	13.72	11.00	10.67
61	13.35	13.13	14.06	2.51	2.16	4.03	10.84	10.97	10.03
62	11.65	12.49	14.21	1.96	2.14	3.93	9.69	10.35	10.28
63	12.33	12.61	14.95	1.75	1.91	3.46	10.58	10.70	11.49
64	11.26	—	13.68	1.22	—	2.71	10.04	—	10.77
65	10.27	16.56	12.56	1.22	2.28	2.66	9.05	14.28	9.70
66	11.54	18.07	13.70	1.28	3.06	2.74	10.26	15.01	10.96
67	10.76	21.13	13.69	1.13	4.13	2.86	9.63	17.00	10.83
68	11.18	21.93	14.20	.89	4.39	2.91	10.29	17.54	11.29
69	12.11	22.19	14.77	.72	3.88	2.80	11.39	18.31	11.97
1970	16.70	18.29	17.16	1.06	2.55	2.65	15.64	15.74	14.51
71	18.01	—	21.97			2.78	17.01	—	19.19
72	18.91						17.91		
72.5	20.90						19.90		

TABLE 6, 7, 8
Data Points for Figure 6, Figure 7, and Figure 8

YEAR	PSYCHOSIS			PSYCHONEUROSES			CHAR + BEHAV		
	ARMY	NAVY	A.F.	ARMY	NAVY	A.F.	ARMY	NAVY	A.F.
1942	3.50	1.77		16.70			4.80		
43	2.60	1.73		28.90			5.10		
44	2.80	1.58		29.90			4.60		
45	2.30	1.50		22.00			4.30		
46	—	1.29		—			—		
47	—	1.44		—			—		
48	—	1.39		—			—		
49	—	1.14		—	2.79		—	3.54	
1950	—	1.00		—	3.25		—	4.02	
51	3.23	1.34	1.16	9.70	4.39	7.56	5.50	7.26	7.13
52	2.70	1.31	1.40	6.80	3.32	5.17	5.40	7.50	6.42
53	2.76	1.23	1.21	5.60	4.61	4.82	5.60	7.07	4.81
54	2.60	1.04	1.58	4.40	3.50	4.42	4.80	5.63	3.83
55	2.35	1.23	1.83	4.20	3.46	4.25	5.10	5.24	3.83
56	2.29	1.06	1.65	3.74	3.12	4.08	7.50	6.08	4.03
57	2.16	1.00	1.70	3.56	3.18	3.88	7.73	6.18	4.38
58	1.94	.94	1.38	2.87	2.88	4.05	7.34	5.72	3.87
59	1.93	.94	1.45	2.45	2.64	3.86	6.97	6.16	3.73
1960	1.88	.97	1.59	2.28	2.44	3.90	8.31	6.71	4.41
61	1.59	.99	1.43	2.06	2.30	3.63	2.46	6.73	4.23
62	1.20	.91	1.34	1.74	2.21	3.84	2.32	6.23	4.27
63	1.42	.76	1.50	1.42	2.28	4.27	2.64	6.54	4.61
64	1.48	—	1.37	1.73	—	4.06	2.67	—	4.24
65	1.36	1.69	1.21	1.58	3.34	3.79	2.33	7.77	3.54
66	1.70	1.66	1.09	1.86	3.54	4.24	2.53	7.86	4.06
67	1.63	2.00	1.18	1.65	4.37	3.89	2.40	8.13	4.17
68	1.82	2.43	1.30	1.90	4.42	3.75	2.31	8.38	4.43
69	2.60	2.46	1.46	1.69	4.22	3.98	2.49	9.43	4.45
1970	3.33	1.88	1.80	2.43	3.07	4.27	4.07	8.43	5.46
71	2.55		1.99	2.10		4.91	7.60		8.83
72	3.49			2.30			7.80		
72.5	4.30			2.50			9.00		

TABLE 8a, 9, 10
Data Points for Figure 8a, Figure 9, and Figure 10

Year	Army C+3 "Other"	Psychiatry (Excluding Psych + Nervous)			HEPATITIS		
		Army	Navy	A.F.	Army	Navy	A.F.
1942	4.80 2.00		8.10			15.18	
43	5.10 2.60		9.80			4.20	
44	4.60 2.50		8.00			3.57	
45	4.30 2.70		7.40			10.10	
46	— —		—			4.60	
47	— —		—			4.00	
48	— —		—			3.70	
49	— —		— 3.87			3.40	
1950	— —		— 4.80			4.50	
51	5.50 3.50	9.00	8.31 7.87			4.80 2.42 2.12	
52	5.40 2.60	8.00	8.12 6.96			3.50 1.95 1.91	
53	5.60 2.50	8.10	7.79 5.46			2.60 2.30 1.91	
54	4.80 1.50	6.30	6.15 4.83			2.50 2.04 1.92	
55	5.10 1.30	6.40	5.86 4.75			2.10 1.51 1.67	
56	7.50 1.64	9.14	6.73 4.53			1.63 1.03 1.26	
57	7.73 2.16	9.89	6.79 4.85			1.41 .84 1.25	
58	7.34 1.66	9.00	6.48 4.41			1.31 .94 1.04	
59	6.97 1.24	8.21	7.04 4.29			1.08 .88 1.05	
1960	8.31 1.25	9.56	7.59 5.19			1.41 .89 1.12	
61	2.46 4.73	7.06	7.68 4.97			1.37 .80 1.09	
62	2.32 4.43	6.72	7.23 5.11			1.10 .76 .93	
63	2.64 4.49	7.44	7.66 5.72			1.13 .85 .89	
64	2.67 4.16	6.87	— 5.54			.90 — .79	
65	2.33 3.78	6.13	9.25 4.90			1.00 .76 .77	
66	2.53 4.17	6.73	9.81 5.63			1.28 .82 .87	
67	2.40 3.95	6.40	10.63 5.77			2.41 1.07 1.19	
68	2.31 4.17	6.61	10.69 6.24			3.37 1.18 1.29	
69	2.49 4.62	6.99	11.63 6.52			3.02 1.40 1.26	
1970	4.07 5.81	9.77	10.79 8.44			4.09 1.37 1.41	
71	7.60 4.80	12.40	— 12.30			5.03	1.51
72	7.80 4.20	12.00				5.13	
72.5	9.00 4.10	13.10				4.90	

TABLE 11, 12, 13
Data Points for Figure 11, Figure 12, and Figure 13

<u>YEAR</u>	<u>ALL DISEASES</u>			<u>PSYCHIATRIC</u>			<u>PSYCHOSIS</u>		
	<u>WW</u>	<u>US</u>	<u>OVER</u>	<u>WW</u>	<u>US</u>	<u>OVER</u>	<u>WW</u>	<u>US</u>	<u>OVER</u>
1942	658	670	607	28.30	30.10	19.80	3.50	3.60	2.80
43	699	676	769	41.30	43.10	36.00	2.60	2.40	3.10
44	547	538	557	40.70	40.70	40.70	2.80	2.50	3.20
45	511	479	532	31.70	35.70	29.10	2.30	2.00	2.40
46	597	505	728	—	—	—	—	—	—
47	574	447	713	—	—	—	—	—	—
48	427	357	535	—	—	—	—	—	—
49	407	334	531	—	—	—	—	—	—
1950	430	347	559	—	—	—	—	—	—
51	442	419	481	21.94	20.70	23.70	3.23	4.00	2.10
52	359	323	390	17.68	15.70	18.90	2.70	3.00	2.20
53	356	356	356	16.52	14.60	18.60	2.76	3.30	2.20
54	291	284	298	13.25	12.70	13.60	2.60	3.10	2.00
55	305	300	312	12.99	12.90	13.20	2.35	2.80	1.80
56	282	277	288	15.17	16.95	12.70	2.29	2.75	1.64
57	394	392	395	15.62	18.05	11.90	2.16	2.37	1.84
58	346	354	334	13.81	15.73	10.73	1.94	2.11	1.66
59	304	310	296	12.56	14.73	9.03	1.83	1.89	1.74
1960	297	304	288	13.72	17.01	8.84	1.88	2.08	1.59
61	263	265	261	10.84	10.40	11.20	1.59	1.75	1.34
62	257	262	250	9.69	10.00	9.30	1.20	1.44	.83
63	248	249	247	10.58	11.00	10.08	1.42	1.66	1.07
64	230	241	214	10.04	10.10	10.10	1.48	1.65	1.23
65	239	255	219	9.05	9.10	9.10	1.36	1.62	1.02
66	297	322	266	10.26	10.70	9.70	1.70	2.05	1.25
67	288	300	274	9.63	9.50	9.63	1.63	1.80	1.44
68	327	361	289	10.29	9.90	10.70	1.82	1.94	1.71
69	300	328	268	11.39	10.40	12.30	2.60	2.45	2.77
1970	311	347	273	15.64	12.50	18.70	3.33	3.05	3.62
71	302	343	255	17.01	15.70	18.50	2.55	2.70	2.60
72	354	423	251	17.91	19.50	15.30	3.49	3.20	4.00
72.5	343	370	255	19.90	16.20	25.30	4.30	3.40	5.80

TABLE 14, 15, 16, 17
Data Points for Figure 14, Figure 15, Figure 16, and Figure 17

	PSYCHOSIS			MOTOR VEHICLE		MOTOR VEHICLE	
	US	MDW	64A	US	54A	OVER	EUROPE
1951	4.00						
52	3.00	6.50	2.70				
53	3.30	4.30	3.90	8.80	13.40	4.70	7.30
54	3.10	5.80	3.90	8.20	12.70	4.80	7.80
55	2.80	3.90	2.40	9.20	11.60	5.50	7.30
56	2.75	5.27	2.00	9.57	13.68	6.29	8.42
57	2.37	5.10	1.43	8.28	10.55	6.33	7.97
58	2.11	5.17	1.39	7.36	9.00	6.81	7.99
59	1.89	2.34	1.55	6.96	7.70	6.41	7.12
1960	2.08	3.85	1.42	6.96	8.48	6.69	7.17
61	1.75	2.42	.93	6.24	7.16	5.53	6.47
62	1.44	3.28	.72	5.89	5.77	4.82	5.55
63	1.66	4.79	.71	5.88	6.61	5.84	6.90
64	1.65	10.03	1.30	5.67	7.60	5.89	7.03
65	1.62	3.78	1.86	5.34	7.90	5.31	6.38
66	2.05	8.56	3.39	5.20	8.00	4.38	5.84
67	1.80	5.77	3.97	6.08	9.40	3.70	5.17
68	1.94	4.41	4.40	5.91	8.81	3.88	5.56
69	2.45	4.40	6.04	6.33	8.97	2.83	4.02
1970	3.05	5.88	6.06	6.38	12.47	3.37	5.49
71	2.70	4.50	4.90				
72	3.20	5.70	3.90				
72.5	3.70	3.20	4.00				

TABLE 18
Data Points for Figure 18

YEAR	PSYCHIATRIC		PSYCHIATRIC		
	WW	Europe	WW	Europe	SWPac
1917	6.35	1.87	1942	28.30	15.10
1918	12.06	6.68	1943	41.30	20.40
1919	5.52	4.75	1944	40.70	42.70
1920	8.41	5.58	1945	31.70	28.60
1921	7.58	6.80			41.40
1922	6.77	8.26			

YEAR	PSYCHIATRIC			
	WW	Korea	Navy WW	Marines Korea
1950			9.05	76.80
1951	21.94	38.20	14.04	42.10
1952	17.68	27.00	12.75	9.10
1953	16.52	19.30	13.63	10.50
1954	13.25	11.00	10.69	10.80

YEAR	Psychiatric	
	WW	Vietnam
1965	9.05	6.98
1966	10.26	11.80
1967	9.63	9.80
1968	10.29	12.70
1969	11.39	15.40
1970	15.64	25.20
1971	17.01	31.30
1972	17.91	10.40
1972.5	19.90	24.20

TABLE 19
Data Points for Figure 19

<u>Psychosis</u>			
<u>YEAR</u>	<u>WW</u>	<u>Europe</u>	<u>SWPA</u>
1942	3.50	2.40	2.80
1943	2.60	2.80	4.30
1944	2.80	2.50	6.00
1945	2.30	1.50	5.00

<u>Psychosis</u>		
	<u>WW</u>	<u>Korea</u>
1951	3.23	2.50
1952	2.70	2.60
1953	2.76	2.30
1954	2.60	1.70

<u>Psychosis</u>		
	<u>WW</u>	<u>United Nations</u>
1965	1.36	1.57
1966	1.70	1.43
1967	1.63	1.75
1968	1.82	1.82
1969	2.60	3.58
1970	3.33	4.30
1971	2.55	2.90
1972	3.49	2.00

TABLE 20, 21, 30
Data Points for Figure 20, Figure 21, and Figure 30

YEAR	ALL CAUSES			% NP	ARMY STRENGTH
	WW	U.S	OVER		
1942	743	750	714	4.738	3,242,710
43	782	749	885	6.343	6,870,616
44	625	601	649	7.552	7,791,006
45	577	523	613	6.534	7,432,042
46	648	540	802	2.778	1,435,495
47	631	493	784	3.043	685,458
48	482	405	603	3.776	554,030
49	460	380	595	3.196	660,473
1950	535	402	745	3.589	593,167
51	514	472	582	5.000	1,531,774
52	417	378	462	5.173	1,603,711
53	406	397	415	5.084	1,532,905
54	337	326	349	5.172	1,425,719
55	352	344	362	4.849	1,193,337
56	328	319	339	5.790	1,034,936
57	439	434	443	4.357	977,068
58	397	401	391	4.348	856,575
59	355	357	353	4.451	830,521
1960	346	348	344	4.919	834,673
61	309	306	315	4.320	874,372
62	300	300	301	3.883	984,496
63	291	286	298	4.237	918,116
64	271	278	262	4.155	933,066
65	282	288	273	3.642	933,332
66	350	356	344	3.297	1,163,046
67	349	336	364	3.083	1,386,156
68	400	392	410	2.795	1,438,112
69	361	359	363	3.355	1,411,929
1970	367	383	349	4.550	1,222,273
71	347	383	305	5.190	1,037,635
72	391	462	286	4.836	793,992
72.5	380	411	288	5.500	784,210

TABLE 22, 23, 24, 25, 26, 27, 28, 29
Data Points for corresponding Figures

	<u>Fig 22</u>	<u>Fig 23</u>	<u>Fig 24</u>	<u>Fig 25</u>	<u>Fig 26</u>	<u>Fig 27</u>	<u>Fig 28</u>	<u>Fig 29</u>
1942								
43				181,662	2.644	14,034	.2043	7.73
44				161,214	2.069	17,591	.2258	10.91
45				265,099	3.527	28,697	.3861	10.83
46				44,875	3.126			
47				26,170	3.818			
48				19,411	3.504			
49				16,199	2.453			
1950				14,945	2.520			
51				28,866	1.884			
52				26,583	1.658			
53				19,711	1.286			
54				14,514	1.018			
55				12,503	1.048			
56				11,061	1.069	991	.0958	8.96
57	18.1	.6	3.315	10,720	1.097	855	.0875	7.98
58	17.2	.5	2.907	9,453	1.104	838	.0978	8.86
59	16.8	.6	3.571	9,166	1.104	780	.0939	8.51
1960				9,154	1.097	798	.0956	8.72
61	17.8	.6	3.371	8,825	1.109	802	.0917	9.09
62	18.0	.7	3.889	9,277	.942	850	.0863	9.16
63	18.0	.7	3.889	8,530	.929	846	.0921	9.92
64	18.3	.8	4.372	8,466	.907	828	.0887	9.78
65	18.8	.8	4.255	8,483	.909	810	.0868	9.55
66	18.8	.8	4.255	11,015	.947	1011	.0869	9.18
67	19.9	.9	4.523	12,641	.912	1117	.0806	8.84
68	21.9	1.1	5.023	14,941	1.039	1167	.0811	7.81
69	22.3	1.3	5.830	14,330	1.015	1208	.0856	8.43
1970	23.5	1.4	5.957	12,390	1.014	1166	.0954	9.41
71	23.7	1.7	7.173	10,572	1.019	1194	.1151	11.29
72	25.2	1.8	7.143	8,568	1.079	1056	.1330	12.32
72.5				7,824	.998	980	.1250	12.53